the dwarf palms. The vigour of pollen as assessed by pollen tube length varied between tall dwarf palms. Using this protocol coconut pollen from two accessions (WCT and COD) was also cryopreserved in liquid nitrogen for period ranging from six months to four years to study the effect of storage duration on viability and fecundity of cryopreserved pollen. It was noticed that pollen vigour increased once coconut pollen was cryopreserved. For nut set studies, cryopreserved pollen from COD palm was artificially pollinated on WCT and *vice versa.* Normal seed set was observed in these crosses on artificial pollination with cryopreserved pollen. The efficacy of pollen cryopreservation protocol as a strategy for long term conservation of coconut genetic resources is highlighted.

L 14

Leaf anatomy and molecular characterization of healthy and root (wilt) affected coconut palms

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The present study involved the investigation on anatomical and molecular variation associated with healthy and root (wilt) affected coconut palms. Leaf samples from healthy and disease infected (RWD) palms of MGD, MOD, MYD, CGD, COD and WCT, during the month of May (2011) were collected from CPCRI Kasaragod and Neriyamangalam. Anatomical studies revealed significant differences in cuticle thickness, width of parenchyma cells, distance between lower epidermis and phloem etc., (at status level) and in width of large vascular bundles, thickness of small and large vascular bundles, area of sclerenchyma cells, distance between lower epidermis and phloem etc.,(cultivar level). Molecular characterization of younger leaves of root (wilt) affected palms were done using 10 polymorphic SSR primers. Maximum similarity was seen between MOD-IW (D), MGD-IW (H) (0.9166667) and MGD-IW (H), MYD-IW (D) (0.9166667). Minimum similarity was observed in CGD-IW (D), WCT-IW (H) (0.4000000) and CGD-IW (H), WCT-IW (H) (0.4000000). COD-IW (H), MYD-IW (D) and MYD-IW (H) grouped separately with a few palms showing intergroup affinity. CGD-IW (D) and CGD-IW (H) clustered with 100% similarity.

L 15

Response of coconut seedlings to elevated carbon dioxide (ECO_2) and high temperature

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The effect of climate change variables Elevated Carbon dioxide (ECO_2) and Elevated Temperature (ET) on the growth and development of coconut seedlings was studied in an Open Top Chamber

(OTC) at CPCRI, Kasaragod. Seedlings were grown at ambient, ECO_2 (550 and 700 ppm), ET (3°C above ambient) and ECO_2+ ET [550 ppm (CO_2) + 3°C] condition. Plants in ECO_2 treatments accumulated significantly higher biomass. It was 1.13 and 1.98 kg/palm with 550 and 700 ppm (CO_2) respectively as against 1.10 in ambient treatment. It was the least in ET treatment (0.91). Plants in ambient treatment had crown growth rate of 1.5cm/day while it was 2 cm/day in ECO_2. It was only 1.3 cm/day with ET and 1.7 cm/day with ECO_2+ET. A strong association was observed between biomass accumulation and photosynthesis (PN). PN was significantly higher in ECO_2 treatment compared to ambient and ET treatments. ET treated plants had significantly low chlorophyll content. Interestingly, ECO_2 treated plants had higher leaf water potential (-10.92 mPa) compared to ambient (-11.93 mPa) and ET (-12.35mPa) treatments suggesting higher Water Use Efficiency (WUE) of plants in ECO_2 treatments. This was reflected in the activity of superoxide dismutase as it was significantly high in ET (1.25 units/ mg protein) as compared to ECO_2 (0.91 units/ mg protein) and ambient treatment (0.81 units/ mg protein). However, the Epicuticular Wax Content (ECW) was high in both ET and ECO_2 treatments compared to ambient treatment. Thus, from this study it is clear that high temperature of future climate might reduce the growth and development of coconut, but the ECO_2 could to certain extent offset the negative effect of temperature.

L 16

Arbuscular mycorrhizal fungal diversity of Silent Valley National Park

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Silent Valley National Park (SVNP), located in the Palakkad district of Kerala, is a part of the South Western Ghat of India representing a unique patch of undisturbed tropical evergreen rain forests, rich in biodiversity with many new, rare and important plant species. Though the floristic wealth of the area is well explored, study on the occurrence and distribution of one of important symbiotic soil microorganism *viz*. the arbuscular mycorrhizal (AM) fungi remained untouched. Inadequate phosphorus, in available form, in soil is one of the major factors that limit plant growth in tropical region. AM fungi have been proposed as a low input solution to these problems because of their ability to increase the efficiency of phosphorus uptake and improve plant tolerance to extreme climatic conditions. A study was conducted to record the diversity of AM fungi of the SVNP. Silent Valley National Park has four forest sections, namely, Sairandhri, Neelikallu, Poochipara and Valakkadu. Because of the accessible terrain and undisturbed forest cover Poochipara and Valakkadu sections were selected for the present study. From 2007-2010 twelve field collection trips were conducted in the study area covering all the seasons. Rhizopshere soils and root bits were collected, transported to lab in TBGRI and the AM spore diversity and root colonization in the samples were studied following standard isolation and staining procedures. Identification of the spores was done microscopically by studying the size, cell wall structure, colour and ornamentations.