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Strategy for Phenotyping Physiological Traits in Mango (*Mangifera indica* L.) for the development of Abiotic Stress Tolerant Varieties

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Abiotic stresses such as drought, heat and cold waves, nutrition stress and soil salinity are threats for mango cultivation in the subtropical climatic regions of India. This demands development of abiotic stress tolerant varieties by focussed breeding programmes involving identification and characterisation of tolerant traits in germplasm which were evolved as adaptive strategies. In India, establishment of automated high throughput infrastructure which allows plants to be exposed to various stresses and to evaluate and characterise physiological and morphological traits is in the progress. Till that infrastructure is in place, phenotyping for abiotic stress tolerant traits which are heritable and constitutive like waxes, stomatal index; induced or acquired traits like osmolytes, scavenging enzymes, abscisic acid content and gas exchange; secondary traits like relative water content, water potential, canopy temperature, leaf senescence could be evaluated at the field/lab level. The advanced techniques like oxygen isotope ratio ($^{18}O/^{16}O$), carbon isotope discrimination ($\Delta^{13}C$), chlorophyll fluorescence, state of PSII (Fv/Fm) and SPAD chlorophyll meter readings could also be employed as techniques for assessing stress and screening the germplasm for stress tolerance. Salinity tolerance is more in polyembryonic than in monoembryonic genotypes of mango. The characteristics like lower leaf concentration of K^+ , Cl^- , Mg^+ and Na^+ exclusion in shoots and accumulation in root cell vacuoles could be candidates for phenotyping for rootstocks. All these tools and techniques when aligned with the proper phenological stages using modified BBCH scale of mango would help in standardization of stage for phenotyping for the development of climate resilient mango varieties.