D-63 Physiological, biochemical and anatomical differences among different varieties and forms of coconut in Sri Lanka

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The objective of this study is to ascertain physiological, biochemical and anatomical differences among locally available coconut varieties, their forms and improved varieties as detailed information is meagre.

Physiological parameters (rate of photosynthesis, stomatal resistance, rate of transpiration, leaf water potential), biochemical parameters (total chlorophyll content, nitrate reductase activity) and anatomical parameters (stomatal density, leaf and cuticular thickness and epicuticular wax content) were measured in 3 local varieties and 4 improved varieties of coconut at 3 monthly intervals.

Improved varieties Dwarf Green x Tall, Dwarf Yellow x Tall, Tall x Tall, green and yellow colour forms of dwarf variety showed high rates of transpiration in the range of 19.786-21.657 $\mu g\ cm^{-2}s^{-1}$. Transpiration rate of other forms is in the range of 13.809 - 16.217 $\mu g\ cm^{-2}s^{-1}$. Accordingly Dwarf Green x Tall, Dwarf Yellow x Tall, Tall x Tall, Dwarf Green and Dwarf Yellow showed significantly lower stomatal resistance compared to other forms. Results did not indicate a statistical significance in leaf water potential. Differences in the rate of photosynthesis was observed among the forms of different varieties. Thembili and Bodiri showed significantly higher rates of photosynthesis compared to others. Photosynthetic rate of Typica Green, San Ramon and Kamandala was moderately higher than the other forms. It was observed that all 3 colour forms of dwarf variety have higher stomatal density than the other varieties. Three dwarf forms and Thembili recorded significantly lower contents of epicuticular wax. There was no significant differences in total chlorophyll content among the varieties and forms except Dwarf Yellow and Dwarf Red in which chlorophyll contents were significantly low. Nitrate reductase enzymic activity was significantly higher in Thembili than the others.

These results exhibit differences in physiological, biochemical and anatomical characters among the different varieties and forms. Desirable characters of Thembili may be exploited for improvement of existing varieties and forms by crossing.