Chlorophyll and Organic Acid Contents of Arecanut

Willstatter and Stoll (1928) determined the chlorophyll contents of *Ulva lactuca* and number of different species of higher plants and found that the proportion of chlorophyll 'b' to 'a' was higher. Griffith *et al* (1944), Arnon (1949), Ramakrishnan *et al* (1969), Soni and Randhawa (1969), Yadava (1969) and others have determined the pigments and organic acid contents from various species of different families and plants grown under a wide range of ecological conditions. No such data are available for the chlorophyll and organic acid contents of Arecanut species grown in India. Therefore, the present investigations were undertaken to determine the total chlorophyll 'a' and 'b' and organic acids in Arecanut species and the results are reported in this note.

Samples of green leaves of different species of Arecanut palms (*Areca catechu* L.; *Areca triandra* L.; *Areca normanbyi* and *Actinorhytis calapparia*) were collected from the exotic garden of the Central Plantation Crops Research Institute, Vittal. Two leaf-lets collected at nearest possible distance formed one replication and there was 5 replicates in each of the species.

The chlorophyll was extracted by aqueous acetone according to the method of the Mackinney (1941) and the concentration was measured by measuring the absorbency of the solution using 'Spectronic-20' at 663 and 645μ wave length. Finally, the fractions of chlrophylls were calculated from the absorption data using the equations of Comar (1942). The organic acids content was determined in the dry powdered material as suggested by Vickery and Meiss (1953). Results are given in Table-1.

TABLE 1. *Chlorophyll and organic acid contents in Arecanut*

Species	Concentration of pigments in mg/L			Ratio	Total organic acid meq/ 100g (dry wt)
	Total chlorophyll	Chlorophyll 'a'	Chlorophyll 'b'	a : b	
Areca catechu L.	1.17644	0.48553	0.69192	0.7074	22.20
Areca triandra L.	1.59011	0.70393	0.88762	0.7990	24.20
Areca normanbyi	1.33546	0.66798	0.66862	1.0966	28.00
Actinorhytis calapparia	1.48540	0.76639	0.73667	1.0664	27.20
S.E.	±0.18591	±0.06849	±0.15310	±0.2188	± 2.30
C.D. (P=0.05)	0.24925	0.09182	N.S.	0.2933	2.93

Among the species, *A. triandra* contained higher value of total chlorophyll while *A. catechu* has the minimum quantity. Similarly, *A. normanbyi* shows the minimum amount of it than *Actinorhytis calapparia* but, superior than *A. catechu*. In general, *A. triandra* contains significantly higher value of total chlorophyll content than the other species of arecanut. Chlorophyll 'a' follows the same

trend in all species as in the case of total chlorophyll content. On the other hand, *A. triandra, A. calapparia* and *A. catechu* contain higher amount of chlorophyll 'b' than chlorophyll 'a' respectively except *A. normanbyi*. However, *A. normanbyi* and *A. calapparia* indicate a marked difference in the ratios of chlorophylls 'a' and 'b' over *A. triandra* and *A. catechu* respectively, although the total chlorophyll contents are not far different except *A. triandra*. In the case of organic acid content, *A. normanbyi* contains significantly higher value than the other species followed by *A. catechu* with lesser quantity. In general, the species differences are statistically significant.

Acknowledgements: Thanks are due to Shri K. Shama Bhat, Arecanut Specialist, for his keen interest and for providing facilities during the course of this investigation and to the members of the Botany Section of this Institute for the collection and identification of species.

Central Plantation Crops Research Institute, Vittal, Mysore State, India.

R. B. R. YADAVA

C. K. MATHAI

REFERENCES

Arnon, D. I. 1949. Determination of chlorophyll. *Plant Physiol.*, **249** : 1–15.

Comar, C. L. 1942. Chloroplast substance of spinach leavcs. *Bot. Gaz.*, **104** : 122–27.

Griffith, R. B., W. D. Valleau and R. N. Jeffrey. 1944. Chlorophyll and carotene content of eighteen tobacco varieties. *Plant Physiol.*, **19** : 688–93.

Mackinney, G. 1941. Absorption of light by chlorophyll solutions. *J. Biol. Chem.*, **140** : 315–22.

Ramakrishnan, K., K. K. N. Nambiar and M. N, Alagianagalingam. 1969. Physiology of virus-infected plants. *Proc. Indian Acad. Sci.*. **69** : 104–14.

Soni, S. L. and G. S. Randhawa. 1969. Changes in pigments and ash contents of lemon peel during growth. *Indian J Hort.*, **26** : 21–26.

Vickery, H. B. and A. N. Meiss. 1953. Chemical investigation of tobacco plant. *Conn. Agric. Exp. Stat. Bull.*, No. **569** : 22.

Willstatter, R. and A. Stoll. 1928. Investigations on chlorophyll, translated by F. M. Schertz and A. R. Merz. Science Press, Lancaster pa. 380.

Yadava, R. B. R. 1969. Effect of B-995 (N-dimethylamino succinamic acid) on chlorophyll and organic acid contents of tobacco (*Nicotiana tabacum* L.) leaves. Indian Sci. Cong. 56th sessjon Part III. Abst. No. 44 : 588.