Electrophoretic Patterns of Soluble Leaf Proteins of *Curcuma*

Electrophoretic patterns of proteins were shown to be of considerable application in taxonomical and varietal identification (Gottlieb, 1977). A preliminary study was undertaken to see the usefulness of this technique in the identification of cultivars and species of *Curcuma*.

Sixteen cultivars of *C. longa*, two of *C. aromatica* and one accession of *C. amada* were used for this investigation. Protein extracts from leaf samples were prepared in 0.1 M phosphate buffer (pH 7.2) and fractionation of proteins was carried out by disc gel electrophoresis in 10 per cent SDS-Polyacrylamide gel following the technique of Shapiro, Vinuela and Maizel (1967) The run was performed at 4 m amps of current for 5 hours. The gels were stained in 1 per cent coomassie brilliant blue and destained by successive changes in 7 per cent acetic acid.

The data on the banding pattern is given in Table I. Thirteen bands could be resolved and among these, band number 8 was present in all the cultivars, while 12 and 13 were present in most of the cultivars. There were considerable differences in the mobility of the bands in different cultivars as evidenced from the variations in the Rf values. Some of the cultivars were found to have only 5 bands. The data clearly indicate the extent of variability in soluble proteins among cultivars of the same species and between species. The bands were very faint in *C. aromatica*, and more or less faint in *C. amada*, as compared to that of *C. longa*. Such intraspecific variations were noted in many plants (Mitra, Jagannath, Bhatia, 1970; Vanghan and Waite, 1967). Earlier studies have shown the usefulness of the electrophoretic data in the study of species relationship (Fox, Thurman and Butler 1964; Hart and Bhatia 1967; Gottlieb, 1977). The present study indicated that in *Curcuma* protein patterns can be taken as a useful tool in the varietal and species identification and delineation.

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Table 1. *Rf values of phosphate buffer extractable proteins in polyacrylamide gels*

Species/Cultivars	Band Numbers												
	1	2	3	4	5	6	7	8	9	10	11	12	13
C. longa													
2a. Mydukur	–	–	0.18	–	0.24	–	0.35	0.49	0.55	0.68	–	0.82	0.91
4a. Gorakhpur	–	–	0.18	0.22	–	–	0.38	0.46	0.56	–	–	0.80	0.94
8c. Kuchipudi	0.02	–	0.16	0.23	0.25	–	–	0.46	–	–	–	0.86	0.88
11a. Vontimitta	0.04	–	0.15	–	–	–	–	0.46	–	–	0.79	–	0.87
12a. Amritapani	–	–	–	–	–	–	0.35	0.44	0.58	–	0.78	0.84	–
13c. Nandyal type	0.02	–	–	0.20	0.24	0.27	–	0.47	–	–	–	0.80	0.89
14b. Rajapuri local	–	–	–	–	–	–	0.40	0.46	0.52	0.68	0.77	–	–
15b. Amalapuram	–	–	0.18	–	0.25	–	0.40	0.42	–	–	0.76	0.82	0.89
16a. Wynad local	–	–	–	0.22	0.26	–	0.38	0.49	–	–	–	0.84	0.91
18a. T. Sunder	–	0.11	0.18	–	–	0.29	0.40	0.46	0.58	–	0.78	–	0.89
20a. Moovattupuzha	0.06	–	0.15	–	–	0.29	0.35	0.49	–	0.62	–	0.83	0.87
21a. Alleppey	–	0.07	0.17	–	0.23	–	0.38	0.49	–	0.67	–	0.86	0.88
23a. Duggirala	–	–	0.15	–	0.24	–	–	0.45	–	0.61	0.73	0.85	–
24d. No. 24	–	0.10	0.17	0.23	–	–	–	0.48	–	–	–	0.83	0.89
27a. Ethamukula	–	–	–	0.21	–	0.30	–	0.48	–	–	0.73	–	–
28a. Thodupuzha	0.02	–	–	–	–	0.29	–	0.47	–	–	0.73	0.83	0.89
C. aromatica													
50. Kasturi	–	–	–	0.22	–	–	–	0.44	0.58	–	–	–	0.89
57. Udayagiri	0.06	0.09	0.17	–	–	–	0.34	0.46	–	0.63	0.79	–	0.87
C. amada	0.06	–	0.15	0.23	–	–	0.32	0.42	0.55	–	–	0.80	–
Curcuma sp. Indonesian type	0.02	–	–	0.23	–	0.31	–	0.45	0.55	0.61	0.71	0.84	–