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Application of different press drying techniques on dehydration of ten ornamental foliagees

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Abstract

At present dry flower business is fastest growing industry in India. Diverse and exotic blooms were available in nature, which can be converted in handsome value added products using simple drying techniques. Press drying is a method used to preserve the plants to use on pictures, place cards, stationery etc. Experiment was undertaken with an objective to standardize the different press drying techniques on dehydration of some ornamental foliage. Experiment was laid out in CRD with five replications and eight treatments. Treatments were set based on trial-and-error method for all the foliage. 10 different foliagees were used for experiment purpose. From the results of above study, it can be concluded that wooden press found best suitable technique for press drying of *Thuja orientalis* foliage. Iron press found excellent technique for *Ficus religiosa* and *Caryota mitis* leaves. Tiles pressed in microwave oven (720 micro powers) for 2 min found finest technique for *Aralia balfouriana*, 3 min found appropriate for *Lantana camara*, *Wedelia trilobata*, *Alstonia scholaris* and *Polyalthia longifolia* leaves and 4 min found ideal for *Nephrolepis exaltata* and *Araucaria excelsa* leaves.

Keywords: Dehydration, press drying, iron press, wooden press, microwave oven press.

Introduction

Flowers are greatest and beautiful creation of God. Flowers are indivisible component of person's happiness and unhappiness particularly in India as man borns with flowers, lives with flowers and at last departures with flowers. In this modern age, floriculture emerged as profitable industry as its importance, utility and scope of ornamentals have been realized (Raghava, 2001) [9]. Flowers colour and fragrance brings a sense of freshness and beauty in life and are beautiful way to express one's feelings and also take part vital role in making individual person's life more happy and cheerful. The best gift ever given to someone is flowers though fresh flowers cannot be stored for long time but gifts in the form of dry flowers are most valuable gift memories of which everlastingly remain in the heart of the person (Bhalla *et al.*, 2006) [2]. Britishers introduced dry flower production industry to Calcutta for its nearness to north and eastern regions, where diverse and exotic blooms were available in nature and this industry is about 40 years old in India. At present dry flower business is fastest growing industry in India. More than 50 companies engaged in this business mainly located at Tamil Nadu, Calcutta and Mumbai. Ramesh Flower Limited at Tuticorin (Tamil Nadu) has about 50 % shares of total dried flowers exported from India (Anonymous, 2014) [1]. Therefore an experiment was undertaken with an objective to standardize the press drying techniques for dehydration of some ornamental foliage.

Materials and Methods

The experiment was carried out in Dry Flower Laboratory at Department of Floriculture and Landscape Architecture, Faculty of Horticulture, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia (Dist.), West Bengal-741252 during the period of 2017 to 2019. Fresh matured leaves were collected within the university campus free from blemishes, pest and disease in the morning after dew/moisture evaporation. Experiment was laid out in CRD with five replications and eight treatments. Treatments were set based on trial-and-error method for all the foliage. 10 different foliagees were used for experiment purpose viz., aralia, Christmas tree, peepal tree, sword fern, thuja, lantana, fishtail palm, wedelia, devils tree and ashoka tree. The following observations were recorded from the experiment i.e. fresh weight of sample (g),

dry weight of sample (g), moisture content loss (%) and dried samples were given subjective scores on average 10 points scale with reference to ornamental values viz., colour, texture, brittleness and appearance/shape retention. Based on cumulative score, ranks were given and the best treatment combinations were worked out (Raj and Gupta 2005)^[10].

Results and discussion

1. *Aralia balfouriana*

The effect of different press drying techniques on aralia leaves

Table 1: Effect of press drying on aralia (*Aralia balfouriana*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	2.06	0.46	77.81	4.00	4.00	4.90	4.90
T ₂	2.50	0.84	66.28	6.50	4.30	4.60	7.70
T ₃	0.61	0.15	76.98	6.60	7.10	7.90	7.40
T ₄	0.66	0.14	77.76	6.50	6.60	7.40	7.20
T ₅	0.71	0.15	79.12	6.90	6.60	6.70	6.80
T ₆	0.75	0.43	42.27	4.70	4.50	7.80	5.90
T ₇	0.70	0.36	48.79	4.30	5.60	7.00	6.40
T ₈	0.59	0.23	61.28	4.70	6.50	6.40	6.10
S.Em (±)	0.01	0.01	0.66	0.05	0.06	0.19	0.06
CD at 5 %	0.03	0.01	1.90	0.15	0.17	0.66	0.18

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2 min, T₄- Tiles pressed in MO for 3 min, T₅- Tiles pressed in MO for 4 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

2. *Araucaria excelsa*

The data presented in Table-2 indicates that peak moisture loss percent in different press dried Christmas tree foliage was recorded in T₅ (56.18 %), which is significantly far with T₆ (41.11 %). Highest sensory score for colour was recorded in

(Table-1) showed that maximum moisture loss percent was recorded in T₅ (79.12 %), which is statistically far with T₆ (42.27 %). The chief sensory score for colour was recorded in T₅ (6.90), which is significantly far with T₁ (4.0). The highest texture score was recorded in T₃ (7.10), whereas least noted in T₁ (4.0). Utmost score for brittleness was recorded in T₃ (7.90), while least found in T₂ (4.60). Appearance score found maximum in T₂ (7.70) and minimum was observed in T₁ (4.90).

T₂ (7.60), whereas least found in T₅ (4.40). Greatest texture score was recorded in T₂ (7.80), which is statistically far with T₆ (4.60). Brittleness score found utmost in T₁ (8.40) and least was noted in T₈ (5.60). Chief appearance score was recorded in T₁ (8.20), which is statistically far with T₈ (5.0).

Table 2: Effect of press drying on Christmas tree (*Araucaria excelsa*) foliage

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	0.75	0.42	44.50	7.00	7.40	8.40	8.20
T ₂	0.77	0.44	42.72	7.60	7.80	8.20	8.00
T ₃	0.51	0.26	49.59	5.60	6.40	7.80	6.00
T ₄	0.75	0.35	53.99	6.60	7.20	7.40	7.40
T ₅	0.63	0.28	56.18	4.40	5.40	6.60	5.40
T ₆	0.72	0.43	41.11	7.20	4.60	8.00	7.60
T ₇	0.74	0.40	45.98	5.60	5.60	6.80	6.00
T ₈	0.67	0.32	52.99	4.60	6.60	5.60	5.00
S.Em (±)	0.01	0.00	0.49	0.06	0.07	0.07	0.06
CD at 5 %	0.02	0.01	1.43	0.17	0.19	0.20	0.19

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 3 min, T₄- Tiles pressed in MO for 4 min, T₅- Tiles pressed in MO for 5 min, T₆- Tiles pressed in HAO for 20 hrs, T₇- Tiles pressed in HAO for 32 hrs, T₈- Tiles pressed in HAO for 44 hrs)

3. *Ficus religiosa*

The data presented in Table-3 shows that chief moisture loss percent was recorded in T₈ (63.34 %), which is significantly far with T₃ (54.13 %) in different press dried techniques of peepal tree leaves. Greatest score for colour was recorded in T₂ (8.0), which is statistically far with T₁ (2.20). Highest score

for texture found in T₂ (7.80), while least was recorded in T₁ (3.80). Brittleness score was found utmost in T₆ (8.0), whereas least noted in T₁ (4.40). Maximum score for appearance was recorded in T₂ (8.40) and minimum found in T₈ (3.60).

Table 3: Effect of press drying on peepal tree (*Ficus religiosa*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	1.51	0.57	62.41	2.20	3.80	4.40	4.60
T ₂	1.01	0.42	58.65	8.00	7.80	7.40	8.40
T ₃	1.33	0.61	54.13	6.80	6.80	7.40	6.80
T ₄	1.34	0.55	58.51	6.40	6.40	7.00	6.40
T ₅	1.39	0.53	61.92	6.00	6.40	5.60	6.00
T ₆	1.34	0.59	56.14	4.60	7.00	8.00	5.00
T ₇	1.81	0.73	59.25	3.80	6.80	7.40	4.20
T ₈	1.85	0.68	63.34	3.40	6.40	6.20	3.60
S.Em (±)	0.02	0.01	0.59	0.05	0.06	0.07	0.05
CD at 5 %	0.05	0.02	1.71	0.14	0.18	0.19	0.15

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 1 min, T₄- Tiles pressed in MO for 2 min, T₅- Tiles pressed in MO for 3 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

4. *Nephrolepis exaltata*

The effect of different press drying techniques on sword fern foliage (Table-4) revealed that peak moisture loss percent was recorded in T₅ (70.17 %), which is statistically far with T₆ (58.35 %). Greatest score for colour was noted in T₂ (8.20), which is significantly far with T₁ (3.40). Highest score for

texture recorded in T₄ (7.60) and least was noted in T₆ (4.80). Brittleness score found maximum in T₆ (8.0), whereas minimum was observed in T₅ (5.40). Chief score for appearance was noted in T₂ (8.0), which is statistically far with T₁ (3.40).

Table 4: Effect of press drying on sword fern (*Nephrolepis exaltata*) foliage

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	2.70	1.10	59.26	3.40	6.40	6.60	3.40
T ₂	2.20	0.76	65.10	8.20	7.40	7.00	8.00
T ₃	1.03	0.36	64.83	7.20	6.80	7.40	7.20
T ₄	1.05	0.34	68.07	7.60	7.60	7.20	7.60
T ₅	1.05	0.31	70.17	6.00	7.20	5.40	6.00
T ₆	1.34	0.56	58.35	3.80	4.80	8.00	3.80
T ₇	1.10	0.44	60.26	4.60	5.60	7.20	4.80
T ₈	1.32	0.45	65.91	5.60	6.60	6.00	5.60
S.Em (±)	0.02	0.01	0.64	0.06	0.07	0.07	0.06
CD at 5 %	0.04	0.02	1.84	0.18	0.19	0.19	0.18

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 3 min, T₄- Tiles pressed in MO for 4 min, T₅- Tiles pressed in MO for 5 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

5. *Thuja orientalis*

Greatest moisture loss percent was noted in T₂ (50.15 %), which is statistically far with T₆ (33.98 %) in case of different press dried techniques of thuja foliage (Table-5). Highest sensory score for colour was recorded in T₁ (6.80), whereas

least observed in T₈ (5.20). Utmost texture score noted in T₁ (7.60), while least was recorded in T₆ (5.20). Maximum score for brittleness was recorded in T₃ (7.70) and minimum noted in T₅ (6.60). Uppermost appearance score was recorded in T₁ (7.80), which is significantly far with T₅ (5.20).

Table 5: Effect of press drying on thuja (*Thuja orientalis*) foliage

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	7.68	4.01	47.63	6.80	7.60	7.60	7.80
T ₂	4.00	1.99	50.15	6.20	6.30	6.70	7.10
T ₃	2.93	1.92	34.67	6.70	5.40	7.70	6.70
T ₄	3.31	1.96	41.05	6.30	6.30	7.30	6.30
T ₅	3.57	1.92	46.24	5.50	7.10	6.60	5.20
T ₆	2.31	1.53	33.98	6.60	5.20	7.50	7.40
T ₇	2.24	1.37	39.14	6.60	6.30	7.20	6.70
T ₈	2.48	1.26	49.40	5.20	6.60	6.80	6.20
S.Em (±)	0.04	0.02	0.44	0.06	0.06	0.07	0.07
CD at 5 %	0.10	0.06	1.26	0.17	0.18	0.20	0.19

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2 min, T₄- Tiles pressed in MO for 3 min, T₅- Tiles pressed in MO for 4 min, T₆- Tiles pressed in HAO for 18 hrs, T₇- Tiles pressed in HAO for 24 hrs, T₈- Tiles pressed in HAO for 30 hrs)

6. *Lantana camara*

A perusal of data on different press drying techniques of lantana leaves (Table-6) revealed that maximum moisture loss percent was recorded in T₅ (75.11 %), which is significantly far with T₂ (57.25 %). Chief sensory score for colour was noted in T₄ (7.0), which is statistically far with T₈ (3.80).

Highest texture score was recorded in T₅ (7.60) and least found in T₁ (4.0). Peak brittleness score was recorded in T₃ (8.0), which is significantly far with T₁ (3.80). Uppermost score for appearance noted in T₄ (8.0), whereas lower most was recorded in T₂ and T₈ (5.40).

Table 6: Effect of press drying on lantana (*Lantana camara*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	0.43	0.16	61.97	4.80	4.00	3.80	6.60
T ₂	0.63	0.27	57.25	5.00	5.40	6.40	5.40
T ₃	0.47	0.14	69.83	5.80	5.60	8.00	7.40
T ₄	0.59	0.15	73.55	7.00	7.20	7.40	8.00
T ₅	0.60	0.15	75.11	6.80	7.60	5.80	7.60
T ₆	0.61	0.23	62.50	4.80	5.40	7.60	5.60
T ₇	0.57	0.18	68.34	5.60	6.60	7.00	6.40
T ₈	0.61	0.15	74.74	3.80	6.60	4.80	5.40
S.Em (±)	0.01	0.00	0.69	0.05	0.06	0.06	0.06
CD at 5 %	0.02	0.01	2.00	0.15	0.18	0.18	0.19

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2 min, T₄- Tiles pressed in MO for 3 min, T₅- Tiles pressed in MO for 4 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

7. *Caryota mitis*

The data pertaining to different press drying techniques of fishtail palm leaves (Table-7) showed that maximum moisture loss percent was noted in T₈ (64.23 %), which is statistically far with T₆ (50.88 %). Sensory score for colour was found utmost in T₅ (7.60), which is statistically far with T₁ (4.0).

Highest texture score was noted in T₂ (7.80), while least found in T₃ (5.60). Uppermost score for brittleness noted in T₂ and T₃ (8.20) and lower most was found in T₈ (5.40). Appearance score was found maximum in T₂ (8.40), which are statistically far with T₆ (5.40).

Table 7: Effect of press drying on fishtail palm (*Caryota mitis*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	1.90	0.73	61.47	4.00	6.80	6.40	5.80
T ₂	2.60	1.02	60.77	7.00	7.80	8.20	8.40
T ₃	1.43	0.62	56.82	6.60	5.60	8.20	6.40
T ₄	1.04	0.43	59.24	7.20	7.40	7.60	7.00
T ₅	1.10	0.40	63.89	7.60	6.60	6.20	7.40
T ₆	1.33	0.66	50.88	4.80	6.00	7.80	5.40
T ₇	1.32	0.57	56.99	5.40	7.20	6.80	6.00
T ₈	1.41	0.51	64.23	6.00	7.60	5.40	6.60
S.Em (±)	0.01	0.01	0.59	0.06	0.07	0.07	0.07
CD at 5 %	0.04	0.02	1.72	0.18	0.21	0.19	0.19

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2.5 min, T₄- Tiles pressed in MO for 3.5 min, T₅- Tiles pressed in MO for 4.5 min, T₆- Tiles pressed in HAO for 24 hrs, T₇- Tiles pressed in HAO for 36 hrs, T₈- Tiles pressed in HAO for 48 hrs)

8. *Wedelia trilobata*

Highest moisture loss percent was noted in T₈ (81.48 %), which is significantly far with T₂ (72.30 %) in case of different press dried techniques of wedelia leaves (Table-8). Chief sensory score for colour was noted in T₄ and T₆ (7.20), which is statistically far with T₁ (4.20). Greatest texture score

was recorded in T₅ (7.40), which is significantly far with T₁ (3.40). Uppermost score for brittleness was noted in T₆ (8.0), whereas lower most found in T₅ (6.0). Utmost score for appearance recorded in T₄ (7.60) and least was found T₈ (5.20).

Table 8: Effect of press drying on wedelia (*Wedelia trilobata*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	0.55	0.13	75.72	4.20	3.40	6.20	6.20
T ₂	0.75	0.21	72.30	4.80	6.00	7.20	7.20
T ₃	0.53	0.13	75.05	6.60	5.40	6.80	6.80
T ₄	0.50	0.11	78.24	7.20	7.20	7.60	7.60
T ₅	0.44	0.09	80.43	6.40	7.40	6.00	7.20
T ₆	0.54	0.13	76.35	7.20	5.40	8.00	7.20
T ₇	0.49	0.10	79.23	6.40	5.80	7.20	6.60
T ₈	0.43	0.08	81.48	4.40	6.40	6.40	5.20
S.Em (±)	0.01	0.00	0.77	0.06	0.06	0.07	0.06
CD at 5 %	0.01	0.00	2.23	0.16	0.18	0.20	0.18

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2 min, T₄- Tiles pressed in MO for 3 min, T₅- Tiles pressed in MO for 4 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

9. *Alstonia scholaris*

A perusal of data (Table-9) on different press dried techniques of devils tree leaves revealed that maximum moisture loss percent was found in T₈ (65.83 %) and minimum was recorded in T₆ (58.20 %). Greatest sensory score for colour was noted in T₂ (8.40), which is statistically far with T₁ (2.0).

Texture score was found utmost in T₅ (7.80) and low most noted in T₁ (3.0). Highest score for brittleness observed in T₆ (7.80), whereas least was noted in T₁ (3.60). Extreme appearance score was recorded in T₂ (8.20), which is statistically far with T₁ (2.0).

Table 9: Effect of press drying on devils tree (*Alstonia scholaris*) leaves

Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	1.41	0.54	61.47	2.00	3.00	3.60	2.00
T ₂	1.34	0.53	60.12	8.40	5.40	5.20	8.20
T ₃	1.05	0.40	61.65	8.20	6.60	7.20	8.00
T ₄	1.54	0.57	63.14	7.80	7.60	6.80	7.60
T ₅	1.54	0.55	64.50	7.40	7.80	5.20	7.20
T ₆	1.10	0.46	58.20	4.40	4.80	7.80	4.60
T ₇	1.30	0.48	62.99	4.60	5.80	7.00	5.00
T ₈	1.36	0.47	65.83	4.80	7.00	5.60	4.00
S.Em (±)	0.01	0.01	0.62	0.06	0.06	0.06	0.06
CD at 5 %	0.04	0.02	1.80	0.17	0.19	0.18	0.16

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 3 min, T₄- Tiles pressed in MO for 4 min, T₅- Tiles pressed in MO for 5 min, T₆- Tiles pressed in HAO for 20 hrs, T₇- Tiles pressed in HAO for 32 hrs, T₈- Tiles pressed in HAO for 44 hrs)

10. *Polyalthia longifolia*

The effect of different press drying techniques on ashoka tree leaves (Table-10) showed that highest moisture loss percent was noted in T₈ (59.08 %), which is significantly far with T₂ (49.87 %). Chief score for colour was noted in T₂ (8.40), which is statistically far with T₈ (3.60). Uppermost texture

score was noted in T₂ and T₅ (8.20), whereas lower most observed in T₈ (5.40). Top brittleness score was recorded in T₂ and T₃ (8.0), which are significantly far with T₈ (4.80). Utmost score for appearance recorded in T₂ (8.40) and least was observed in T₈ (4.40).

Table 10: Effect of press drying on ashoka tree (*Polyalthia longifolia*) leaves

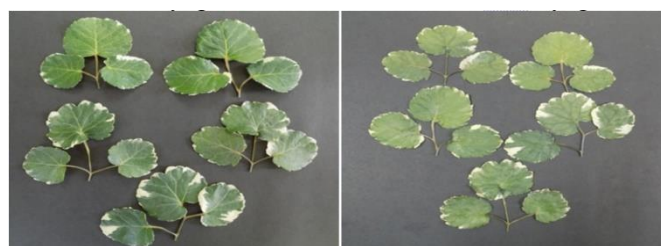
Treatments	FW (g)	DW (g)	ML (%)	Colour	Texture	Brittleness	Appearance
T ₁	1.25	0.56	55.05	4.00	6.00	5.80	7.00
T ₂	0.57	0.28	49.87	8.40	8.20	8.00	8.40
T ₃	0.62	0.28	54.17	6.60	7.40	8.00	6.60
T ₄	0.63	0.28	56.52	7.00	8.00	7.60	7.60
T ₅	0.53	0.22	58.80	7.40	8.20	5.80	7.60
T ₆	0.47	0.23	50.08	6.60	8.00	7.40	6.60
T ₇	0.56	0.26	53.39	5.00	7.00	6.20	5.40
T ₈	0.56	0.23	59.08	3.60	5.40	4.80	4.40
S.Em (±)	0.01	0.00	0.55	0.06	0.07	0.06	0.06
CD at 5 %	0.02	0.01	1.59	0.16	0.19	0.19	0.18

(T₁- Wooden pressed, T₂- Iron pressed, T₃- Tiles pressed in MO for 2 min, T₄- Tiles pressed in MO for 3 min, T₅- Tiles pressed in MO for 4 min, T₆- Tiles pressed in HAO for 12 hrs, T₇- Tiles pressed in HAO for 20 hrs, T₈- Tiles pressed in HAO for 28 hrs)

The fresh weight of samples found insignificant due to homogeneous collection of material for press drying. In few crops, it might have varied due to varying selection of plant samples. These results are in accordance with Yadlod *et al.*, (2016) [16], Safeena and Patil (2007) [12]. Dry weight of flowers was significantly influenced by different drying treatments. These results are in accordance with Renuka *et al.*, (2016) [11] and Mathapati *et al.*, (2015) [5]. Mainly heat energy is added in the course of press drying through various techniques in order to shorten the pressing time. Iron press recorded maximum moisture loss percent in thuja foliage (5.15 %). Hot iron heat might have liberated the moisture from the plant samples and get dried. Iron press will take few minutes get dry the sample and it can easily preserve the flexibility and fall colours of plant materials. Tiles pressed sample in microwave oven drier recorded maximum moisture loss percent in foliages of aralia (79.12 %), Christmas tree (56.18 %), sword fern (70.17 %) and lantana (75.11 %). Several kinds of flower presses are available. Electronically produced microwaves might have liberated moisture from the plant samples by agitating the water molecule. The advantage of this method is we can get finished product in minutes and colour is more vibrant than the traditional pressing. Tiles pressed sample in hot air oven drier recorded maximum moisture loss percent in foliages of peepal tree (63.34 %), fishtail palm (64.23 %), wedelia (81.48 %), devils tree (65.83 %) and ashoka tree (59.08 %). Electrically produced hot air might have removed the moisture from plant samples and get dried. It will take hours to few days to get dried depending upon the plant samples. These results are in confirmation with findings of Singh and Dhaduk (2005) [14], Singh *et al.*, (2017) [15] in local weed flora of south Gujarat and Imtiyaz *et al.*, (2012) [3] in some genera of Kashmir valley.

The qualitative characteristics i.e. colour, texture, brittleness and appearance of the dried flowers were influenced significantly by different drying treatments. Colour plays important role in dehydration to obtain good aesthetic quality of dried flower products. Flower colours observed visibly are the results of reflected light from various plant pigments. Plant materials tend to lose their colour during dehydration largely due to oxidative reactions associated with loss of compartmentation within plant cells during desiccation of the tissue (Sharma *et al.*, 2007 [13]; Meman and Barad, 2009) [6].

Up to certain duration of drying the texture score found increasing after that decreasing trend was observed and surface texture turned to rough importantly at longer duration of drying. Prolonged drying duration recorded maximum brittleness scores in dried flowers, which could be attributed to excessive loss in moisture (Kumari *et al.*, 2017) [4]. The final moisture content in the flowers and foliages after dehydration influences quality as appearance (Mishra *et al.*, (2014) [7]; Nair and Singh (2011) [8].



Before drying

After drying

Plate 1: Iron press dried aralia (*Aralia balfouriana*) leaves



Plate 2: Iron press dried Christmas tree (*Araucaria excels*) foliage



Plate 3: Iron press dried peepal tree (*Ficus religiosa*) leaves



Plate 4: Microwave oven press dried sword fern (*Nephrolepis exaltata*) foliage



Plate 10: Microwave oven press dried ashoka tree (*Polyalthia longifolia*) leaves



Before drying

After drying

Plate 5: Wooden press dried thuja (*Thuja orientalis*) foliage



Plate 6: Microwave oven press dried lantana (*Lantana camara*) leaves



Plate 7: Iron press dried fishtail palm (*Caryota mitis*) leaves



Plate 8: Hot air oven press dried wedelia (*Wedelia trilobata*) leaves



Before drying

After drying

Plate 9: Microwave oven press dried devils tree (*Alstonia scholaris*) leaves

Conclusion

From the results of above experiment, it can be concluded that wooden press drying found best suitable technique for press drying of thuja foliage. Iron press found suitable technique for press drying of peepal tree and fish tail palm leaves. Tiles pressed in MO for 2 min found most suitable technique for press drying of aralia leaves, 3 min found best suitable for ornamental leaves viz., lantana, wedelia, devils tree and ashoka tree leaves and 4 min found ideal for sword fern and Christmas tree foliage.

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