

EVALUATION OF NEELAMARI ACCESSIONS (*INDIGO ERA TINCTORIA L.*) FOR HERBAGE YIELD AND INDICAN CONTENT IN KERALA CONDITIONS

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Abstract: Herbal drugs enjoy the advantages of comparatively less toxic than synthetic drugs, more harmony with the biological system and affordable to all classes of people. Neelamari (*Indigofera tinctoria* L.) an emerging medicinal crop belonging to the family Fabaceae is widely used in traditional medicines, ayurveda, sidda and unani. At present no improved variety is available for commercial cultivation in this crop and only local types are being cultivated. Hence it is the felt need of the farmers to improve its yield and quality so as to make it commercially viable. Hence the present study was made to collect the germplasm of *Indigofera tinctoria* and to characterize for morphological, yield and quality parameters. The experiment was carried out at All India Coordinated Research Project on Medicinal Aromatic Plants & Betelvine (AICRP on MAP & B), College of Horticulture, Vellanikkara during 2011-12 and 12-13. Morphological, yield and quality parameters were taken. All the accessions were erect with brown stem without pubescence red branches and ovate leaves. Bluish green leaves indicative of high indican content was observed in TCRIT 2, 6, 7, 8, 11, 14, 15 and 16. The mean performance for yield and quality parameters indicated that highest herbage yield of 191.50 (g/plant) was recorded by TCRIT 4 which was followed by TCRIT 2 (138.00 g/plant). Indican content in leaf was found to be highest in TCRIT 14 (1.007 %) followed by TCRIT 2 and TCRIT 15 (1.005%)

Key words: Indican, *Indigofera tinctoria*, Neelamari

Introduction: A large proportion of the world population especially the developing countries rely on the traditional system of medicines. The global market of trade related to medicinal plants is estimated around US \$ 60 billion/ year with growth of 7% annually [1]. Demand for herbs and herbal products are increasing not only in India but all over the world mainly because of their natural origin with no or lesser side effects. Herbal drugs enjoy the advantages of comparatively less toxic than synthetic drugs, more harmony with the biological system and affordable to all classes of people. Kerala lies in the lap of Western Ghats, is rich in plant genetic diversity. Collection and conservation of plant genetic resources is important for their wider use and continued availability. In medicinal plants, survey was concentrated in Kerala and the germplasm collections were subjected to systematic screening through stepwise preliminary evaluation, comparative testing and large plot trials in farmer's field in different locations of Kerala. The promising accessions which showed a yield increase of 20-71% and having high content of active biochemicals were released in the state seed subcommittee of Kerala [2]. Neelamari (*Indigofera tinctoria* L.) an emerging medicinal crop belonging to the family Fabaceae is widely used in traditional medicines, ayurveda, sidda and unani. The leaves of the plant contain indigotin, flavonoids, terpinoids, alkaloids and glycosides which are mainly responsible for its wide therapeutic actions. The leaves have anti hyperglycemic, anti bacterial, anti oxidant, cytotoxicity, anti inflammatory, anti hepatoprotective and anti diabetic

properties. The whole plant is used in constipation, liver disease, heart palpitation and gout. The leaves are thermogenic, laxative, trichogenous and expectorant.



Fig. 1 Field view of *Indigofera tinctoria*

Materials and methods: The experiment was carried at AICRP on MAP & B, College of Horticulture, Vellanikkara during 2011-12 and 12-13. Nineteen types of *Indigofera tinctoria* were collected from different parts of the State and used for the study (Fig. 1). Morphological, yield and quality parameters were observed. The total crop duration was eleven months. Herbage was harvested for thrice. The initial herbage was harvested at five months after planting and subsequent harvests at three months interval.

Results and discussion: Morphological characters such as plant habit, stem colour, branch colour, stem pubescence, leaf shape and leaf color were noticed. (Table I) No variation was noticed in plant types, colour of stem and branch, stem pubescence and shape of leaf. All the accessions were erect with brown stem and red branches with ovate leaves and

without stem pubescence.

Table I: Mean performance of *Indigofera tinctoria* for morphological characters

Sl. No.	Accession No.	Source of collection	District	Plant habit	Stem colour	Branch colour	Stem pubescence	Leaf shape	Leaf color
1	TCRIT 1	Athani	Ernakulam	Erect	Brown	Red	Absent	Ovate	G
2	TCRIT 2	Aluva	Ernakulam	Erect	Brown	Red	Absent	Ovate	BG
3	TCRIT 3	Azamannur	Ernakulam	Erect	Brown	Red	Absent	Ovate	G
4	TCRIT 4	Perumbavur	Ernakulam	Erect	Brown	Red	Absent	Ovate	DG
5	TCRIT 5	Thodupuzha	Idukki	Erect	Brown	Red	Absent	Ovate	DG
6	TCRIT 6	Tripunithura	Ernakulam	Erect	Brown	Red	Absent	Ovate	BG
7	TCRIT 7	Chuvannamann	Thrissur	Erect	Brown	Red	Absent	Ovate	BG
8	TCRIT 8	Palakkad	Palakkad	Erect	Brown	Red	Absent	Ovate	BG
9	TCRIT 9	Kanjikod	Palakkad	Erect	Brown	Red	Absent	Ovate	DG
10	TCRIT 10	Pattikkad	Thrissur	Erect	Brown	Red	Absent	Ovate	DG
11	TCRIT 11	Vellayani	Trivandrum	Erect	Brown	Red	Absent	Ovate	BG
12	TCRIT 12	Trivandrum	Trivandrum	Erect	Brown	Red	Absent	Ovate	G
13	TCRIT 13	Kottakkal	Malappuram	Erect	Brown	Red	Absent	Ovate	G
14	TCRIT 14	Tirur	Malappuram	Erect	Brown	Red	Absent	Ovate	BG
15	TCRIT 15	Thrissur	Thrissur	Erect	Brown	Red	Absent	Ovate	BG
16	TCRIT 16	Chalakkudi	Thrissur	Erect	Brown	Red	Absent	Ovate	BG
17	TCRIT 17	Vellanikkara	Thrissur	Erect	Brown	Red	Absent	Ovate	G
18	TCRIT 18	Alathur	Palakkad	Erect	Brown	Red	Absent	Ovate	DG
19	TCRIT 19	Peravur	Ernakulam	Erect	Brown	Red	Absent	Ovate	G

G: Green, BG: Bluish Green, DG: Dark Green

Bluish green leaves indicative of high indican content was observed in TCRIT 2, 6, 7, 8, 11, 14, 15 and 16. Accessions TCRIT 4, 5, 9, 10 and 18 possessed dark green leaves. All other accessions were with green leaves. Mean performance on yield and quality parameters of 19 accessions indicated that the highest herbage yield of 191.50 (g/plant) was recorded by TCRIT 4 which was followed by TCRIT 2 (138.00 g/pt). TCRIT 15 and 14 recorded herbage yields of 128.28 and 102.85 (g/plant) respectively. TCRIT 18, 7

and 15 recorded high canopy spreads of 78.95 cm, 78.75 cm and 76.40 cm respectively. Average number of branches in TCRIT 12, 15, 18 and 7 were 10.8, 10.7, 10.6 and 10.1 respectively. (Table. II) Presence of indican content in leaves was obtained by spectrophotometric method [3]. Indican content in leaf was found to be highest in TCRIT 14 (1.007 %) followed by TCRIT 2 and TCRIT 15 (1.005%). These results suggested that TCRIT 2, 4, 14 and 15 recorded high herbage yield as well as indican content which could be utilised for further studies.

Table II: Mean performance of *Indigofera tinctoria* for yield and quality characters

Sl. No	Plant height (cm)	Branches (No.)	Leaves /branch (No.)	Height to 1 st branch (cm)	Leaf length (cm)	Leaf width (cm)	Canopy spread (cm)	Herbage yield (g/plant)	Indican content (%)
1	51.5	8.2	3.5	6.7	8.8	3.8	40.15	63.525	0.929
2	36.1	7.0	5.0	6.6	7.9	5.0	46.80	138.00	1.005
3	46.4	8.0	5.0	5.7	7.4	4.8	52.80	59.000	0.732
4	61.6	8.5	7.5	6.2	8.5	5.2	64.93	191.50	0.776
5	37.3	7.5	5.0	7.1	6.5	3.7	45.60	85.000	0.856
6	43.8	8.4	4.5	5.3	9.1	5.2	63.00	75.000	0.933
7	49.0	10.1	6.5	3.8	9.7	4.7	78.75	76.845	0.964
8	48.2	8.3	6.5	5.3	8.4	4.8	63.70	69.445	0.971
9	47.8	9.2	4.5	3.7	8.5	4.7	62.40	70.835	0.977
10	44.0	9.7	4.5	3.3	9.3	4.3	52.15	67.160	0.963
11	46.7	8.5	5.5	5.1	6.4	4.0	60.05	86.150	0.905
12	49.2	10.8	7.5	4.4	7.4	3.5	74.90	83.335	0.461
13	43.0	9.8	6.5	4.8	7.6	4.7	68.90	89.880	0.406
14	40.2	8.1	4.5	5.3	8.3	4.0	64.30	102.85	1.007
15	43.5	10.7	4.5	4.6	7.6	4.5	76.40	128.28	1.005
16	44.0	9.9	4.0	4.3	7.9	4.7	67.85	82.010	0.909
17	47.7	9.2	4.0	4.7	8.3	4.3	65.30	70.315	0.991
18	43.6	10.6	6.5	4.3	7.6	4.7	78.95	56.555	0.980
19	41.7	8.6	5.0	3.3	8.9	4.1	67.80	68.665	0.644
CD (.05)	12.02	4.721	1.882	2.157	2.354	1.877	21.04	23.32	0.066
CV (%)	12.84	25.18	17.31	21.33	14.04	20.05	22.97	33.33	4.43
Mean	44.876	8.988	5.214	4.848	8.042	4.488	64.763	85.67	0.856

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