



INTERNATIONAL JOURNAL OF PHARMACY & LIFE SCIENCES
(Int. J. of Pharm. Life Sci.)

**Morphological Study of Seeds of *Sida cordifolia* L. in
Different Localities of District Rewa (M. P.), India**

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Abstract

The present study was undertaken to evaluate the seeds morphology of *Sida cordifolia* L. collected from different localities (Kothi Compound, Civil Lines, A. G. College Campus and Kuthuliya) of district Rewa. *Sida cordifolia* seeds are reniform, about 1.82 mm long and 1.31 mm broad, yellowish brown in colour. The average weight and volume of seeds were noted to be 12.06 mg and 0.97 cc respectively. The maximum seed output capacity was recorded 588.31 in A. G. College Campus and minimum seed output capacity was recorded 403.56 in Kuthuliya (Bichhiya).

Key-Words: *Sida cordifolia*, Morphological profile, Seed output

Introduction

The medicinal plants are in great demand due to increase acceptance of Ayurveda and traditional medicines, and their property of less or no side effects. *Sida cordifolia* L. is a medicinal plant having commercial value for its alkaloid extraction, which can be used as medicine. Apart from alkaloid extraction, the whole plant is used as an herbal medicine with several applications to treat Asthma, bronchitis, neuralgia, rheumatism, sexual debility etc. This crop came into prominence by virtue of its alkaloids like Ephedrine (EDH), Pseudoephedrine, Vasicine and Vasicinol, present in seeds, leaves and roots. [1]

Sida cordifolia L. is a perennial herb of the family Malvaceae. It is common weed of gardens, cultivated fields and waste lands. The plants grow in open, partial shaded and dense shaded places, both in grazed and ungrazed areas. The species is also reported on disturbed grounds such as cleared areas in forest found in boggy and marshy places. [2]

Seed morphology in the result of the various stresses and strains to which a species has been subjected, during its evolution in a specific habitat. Seed characters actually originate due to the interaction of various environmental conditions, prevailing in the habitat of the plants. Pandeya, 1968 [3] stressed that morphology of the seed is an important character in assessing the mode and extent of dispersal of species.

In the present study morphological characteristics of seeds viz. size, weight, volume and seed output were estimated in the different localities of Rewa Nagarpalika area.

Material and Methods

Study sites

The study area is situated between 81°-15' east longitude and 24°-42' north latitude and is situated on Vindhya plateau at the height of 318 meter above m. s. l. The climate is mainly sub tropical and sub humid. The average annual rainfall of the region is 82.953 mm and relative humidity is 79.36 %. Present work was done in the four selected field of Rewa i.e. Kothi Compound, Civil Lines, A. G. College and Kuthuliya (Bichhiya). Information regarding the distribution of *Sida cordifolia* L. incorporated from various literatures, such as Flora of Madhya Pradesh [4], the wealth of India (vol. VI) and Indian Medicinal Plants (Kirtikar and Basu Vol. I to IV). [5]

Morphology

Morphological studies were carried out during 2005 to 2007 which covered pre monsoon, monsoon and post monsoon periods. The seeds are matured within 3 to 4 months. It has been observed that plant contains small and yellow seeds.

Size of the Seed

Ten seeds from all different places were selected at random. Seeds were mounted on the slides and measurement of length and breadth were taken under a travelling microscope fitted with a vernier scale. From the data thus obtained the length / breadth ratio was

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calculated and the average value of each was found out.

Weight of the Seed

Hundred seeds from each of the four localities were selected at random and then their weight was determined on a single pan chemical balance.

Seed Volume

Seed volume was determined by modifying the water displacement method as the seeds showed a tendency to float when put in water. 10 lots of 100 seeds from different localities were taken and volume calculated from the average of readings obtained.

Seed Output

Seed output is the total number of seeds produced by a plant in one season and it represents the potential capacity of a species to reproduce itself. The average seed output of *Sida cordifolia* L. works out to be as follows:

Average seed output = Average no. of fruits per plant
X Average no. of seeds per plant

Results and Discussion

Sida cordifolia L. belongs to family malvaceae, commonly known as “Indian ephedra” because of the presence of alkaloid ephedrin. In Hindi it is known as “Vatya” and in English it is known as “Country Mallow”. *Sida cordifolia* L. is a perennial herb of the family Malvaceae. It is common weed of gardens, cultivated fields and waste lands. [6]

The difference in size, shape, volume and weight of seeds plays an important role in modifying the seed germination. The size of the seeds is important, since their small size confers advantages of position, as they are better dispersed and are likely to reach areas where competition is slight to inhibit the establishment of their seedlings. The large seeds, on contrary, with their less wide dispersal enable the seedlings to meet the challenge of competition.

The results of seeds size are tabulated in tables 1 to 4. The averages seed length, breadth and L/B ratio of *Sida cordifolia* L. in Kothi Compound Campus were 1.865 mm, 1.346 mm and 1.382 respectively. In Civil Lines Campus the averages seed length, breadth and L/B ratio were 1.821 mm, 1.302 mm and 1.395 respectively, in A. G. College Campus the averages seed length, breadth and L/B ratio were 1.853 mm, 1.330 mm and 1.390 respectively and in Kuthuliya (Bichhiya) Campus the averages seed length, breadth and L/B ratio were 1.733 mm, 1.255 mm and 1.380 respectively. The averages seed length, breadth and L/B ratio of different localities were 1.818 mm, 1.308 mm and 1.357 respectively (Table 5). The most noteworthy studies on physical characters of seeds and

growth habit of seedlings were made by Hoff Mayer (1975). [7]

The average weight of seeds of *Sida cordifolia* L. were 12.15 mg in Kothi Compound, 12 mg in Civil Lines Campus, 11.99 mg in A. G. College Campus and 12.12 mg in Khuthuliya locality. (Table 6)

Table 7 shows that the average volume of seeds of *Sida cordifolia* L. was 0.97 cc of different localities. Egley, et. al., 1981 [8] had also studied the morphology of seeds of *Sida spinosa*.

Mishra 1968 pointed out that seed output indicates the amount of energy passed on by a plant to the next generation as most of the species perpetuate, multiply and disperse through seeds. The data obtained from four localities, further, reveal following features of the plant, that the maximum seed output values were obtained in localities Kothi Compound and A. G. College Campus. The average number of seeds per fruit was not constant from locality to locality, but showed a gradual decline from the partial shaded locality (Kothi Compound and A. G. College, Campus) to the exposed locality (Civil Lines and Kuthuliya). The average seed output of *Sida cordifolia* L. was 496.98. (Table 8)

Conclusion

Sida cordifolia L. is a perennial branched herb of the family Malvaceae. There is appreciable variation in the morphological studies. The various data on size, weight, volume and seed output were obtained from in different localities.

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Table 1: Record of Length and Breadth of *Sida cordifolia* L. Seeds of Kothi Compound Campus Locality

S. No.	Length in mm	Breadth in mm	L/B ratio
1	1.84	1.32	1.39
2	1.89	1.35	1.40
3	1.86	1.34	1.38
4	1.90	1.35	1.40
5	1.88	1.36	1.38
6	1.89	1.37	1.38
7	1.82	1.30	1.40
8	1.86	1.38	1.34
9	1.82	1.38	1.34
10	1.89	1.37	1.38
Mean	1.865	1.346	1.382
SD	±0.028	±0.024	±0.017

Table 2: Record of Length and Breadth of *Sida cordifolia* L. Seeds of Civil Lines Locality

S. No.	Length in mm	Breadth in mm	L/B ratio
1	1.84	1.30	1.41
2	1.80	1.30	1.39
3	1.82	1.30	1.40
4	1.80	1.28	1.40
5	1.86	1.34	1.38
6	1.84	1.32	1.39
7	1.82	1.30	1.40
8	1.80	1.28	1.40
9	1.83	1.32	1.38
10	1.80	1.28	1.40
Mean	1.821	1.302	1.395
SD	±0.027	±0.018	±0.009

Table 3: Record of Length and Breadth of *Sida cordifolia* L. Seeds of A. G. College Campus Locality

S. No.	Length in mm	Breadth in mm	L/B ratio
1	1.82	1.30	1.40
2	1.84	1.31	1.40
3	1.88	1.36	1.38
4	1.89	1.37	1.38
5	1.86	1.34	1.38

6	1.88	1.36	1.38
7	1.82	1.30	1.40
8	1.86	1.34	1.38
9	1.84	1.32	1.39
10	1.84	1.30	1.41
Mean	1.853	1.330	1.390
SD	±0.023	±0.026	±0.109

Table 4: Record of Length and Breadth of *Sida cordifolia* L. Seeds of Kuthuliya (Bichhiya)

Locality			
S. No.	Length in mm	Breadth in mm	L/B ratio
1	1.71	1.22	1.40
2	1.72	1.25	1.38
3	1.74	1.27	1.37
4	1.76	1.29	1.36
5	1.74	1.26	1.38
6	1.73	1.23	1.40
7	1.74	1.28	1.36
8	1.76	1.30	1.36
9	1.71	1.21	1.41
10	1.72	1.24	1.38
Mean	1.733	1.255	1.380
SD	±0.022	±0.028	±0.017

Table 5: Record of Average Length and Breadth of *Sida cordifolia* L. Seeds of different Localities

S. No.	Name of Locality	Length in mm	Breadth in mm	L/B ratio
1	Kothi Compound	1.865	1.346	1.382
2	Civil Lines	1.821	1.302	1.395
3	A.G. College Campus	1.853	1.330	1.390
4	Kuthulia (Bichhiya)	1.733	1.255	1.380
Mean		1.818	1.308	1.357
SD		±0.032	±0.022	±0.004

Table 6: Record of Weight of *Sida cordifolia* L. Seeds in Different Localities

S. No.	Weight in 100 seeds in mg			
	Kothi Compound Campus	Civil Lines	A. G. College Campus	Kuthuliya (Bichhiya)
1	12.12	12.04	12.02	12.14
2	12.14	12.08	12.05	12.10
3	12.16	11.98	12.04	12.12
4	12.18	12.02	12.01	12.08
5	12.15	12.01	11.90	12.11
6	12.18	12.05	11.96	12.13
7	12.17	11.96	11.92	12.09
8	12.11	12.04	12.01	12.14
9	12.13	11.90	12.03	12.16
10	12.16	11.95	11.94	12.12
Mean	12.15	12.00	11.99	12.12
SD	±0.023	±0.051	±0.051	±0.022

Table 7: Record of measurement of Seed Volume of *Sida cordifolia* L.

S. No.	Water required to fill the cylinder (CC)	Volume of 100 seeds (CC)
1	9.2	0.8
2	8.9	1.1
3	9.0	1.0
4	8.8	1.2
5	9.0	1.0
6	8.9	1.1
7	8.9	1.1
8	9.2	0.8
9	9.2	0.8
10	9.2	0.8
Mean		0.97
SD		±0.149

Table 8: Record of Average Seed Output of *Sida cordifolia* L. from different Localities

S. No.	Name of Locality	Average number of fruits per plant	Average number of seeds per plant	Average seed output
1	Kothi Compound	49.7	11.6	576.52
2	Civil Lines	36.8	11.4	419.52
3	A.G. College Campus	50.3	11.7	588.31
4	Kuthulia (Bichhiya)	35.4	11.4	403.56
Total		172.2	46.1	1987.91
Mean		43.05	11.53	496.98
SD		±6.97	±0.13	±85.73

How to cite this article

Mishra S. and Dubey S. (2015). Morphological Study of Seeds of *Sida cordifolia* L. in Different Localities of District Rewa (M. P.), India. *Int. J. Pharm. Life Sci.*, 6(6):4557-4561.

Source of Support: Nil; Conflict of Interest: None declared

Received: 23.05.15; Revised: 15.06.15; Accepted: 23.06.15