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ORIGINAL ARTICLE

Studies on Energy Value of *Albizzi alebbek, Dalbergia sissoo* and *Terminalia arjuna*

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ABSTRACT

Albizzi alebbek is a medicinal tree, which is found throughout country. Dalbergia sissoo, know commonly as north Indian rosewood, is a fast-growing hardy deciduous rosewood tree and Terminalia arjuna is a deciduous large sized fluted tree. The present study indicates the efficiency with which the energy is in the storage organ is moved to the growing seedlings in seedling of Albizzi alebbek, Dalbergia sissoo and Terminalia arjuna. This efficiency is higher in T. arjuna probably due to large size and weight of the seed, as compared with the other species under study.

Key words: *Albizzi alebbek, Dalbergia sissoo, Terminalia arjuna, energy content etc.*

INTRODUCTION:

Trees are vitally and intriguingly connected with the life of mainkind. Animal and trees are the co-ordinaters of nature but due to unlimited exploitation, the balance of the life animals and plant has been disturbed greatly. Nature will protect and the nurture the man as long as he reciprocates with it. The role of energy fixation by green plant, through affected by several factors is also dependent to some extent of the chlorophyll content. Knowledge of the energy content of plants is necessary to understand the energy dynamics of individual population in the ecosystem. Energy conserving efficiency (E.C.E.) of the green plants depends upon the intensity of solar radiation and other atmospheric conditions. The subject of ecological energetic is relatively new but there have been rapid and important developments in the field during the recent years.

MATERIAL AND METHODS:

Healthy seeds of *Albizzi alebbek*, *Dalbergia sissoo*, *Terminalia arjuna* were sown in pot after the protrusion of the radical, they were transplanted in the beds of the forest nursery, Aata. All these species were planted in rows spaced at 25 cm across and down wards. Regular weeding were done at the intervals of fifteen days to avoid any inter specific competitions.

The energy values were determined from samples, collected in different months. The samples were dried for 48 hours at nearly 80^0c and then reduced to powder in electric grinder. Before subjecting to caloric analysis the plant material from each category was compressed into pellets (about a gram in weight) and kept in desiccators. Three replicates were made for each sample. The caloric values were determined by igniting the pellets of the plant material in oxygen bomb calorimeter in the presence of oxygen (at 12.5 ib pressure).

The following formula has been followed-

$$E = \frac{W_1 (t_2 - t_1) + W_2 (t_2 - t_1)}{W} \text{ Cal/g dry wt.}$$

Where,

W_1 = Water equivalent of bomb vessel (g), W_2 = Weight of water in gram

W = Weight of pellet of plant material (g) E = Caloric values of plant material

t_1 = Initial temperature (^{0}C) t_2 = Final temperature (^{0}C)

RESULT AND DISCUSSION

Table 1: Energy content in fresh seeds of *A. lebbek*, *D. sissoo*, *T. arjuna*

Seeds	Energy content Cal/g dry wt.	Energy value (Cal/seed)
A. lebbek	4700.40	249.12
D. sissoo	3860.14	65.62
T. arjuna	4070.16	651.22

Table 2: Energy value (Cal/g dry wt.) of different fractional plant parts of *A. lebbek* seeding at different stages of growth

Age (Months)	Leaf	Stem	Root	Average
1	3596	4134	3734	3821
2	3621	4851	4251	4241
3	3762	3527	3392	3560
4	4021	3332	4031	3795
5	4949	3744	3562	4085
6	4444	3874	4685	4334
7	4433	3506	3913	3951
8	4895	2737	3974	3869
9	3896	3912	3375	3728
10	4090	4191	3359	3947
11	3827	3908	3462	3732
12	3814	3345	3182	3447

Table 3: Energy value (Cal/g dry wt.) of different fractional plant parts of *D. sissoo* seedling at different stages of growth

Age (Months)	Leaf	Stem	Root	Average
1	3037	2732	3214	2995
2	3706	3069	3419	3398
3	4288	3271	4379	3979
4	5000	3772	3810	4194
5	4756	4153	3760	4223
6	3843	3677	3675	3732
7	3876	3555	3530	3654
8	3764	2992	2775	3177
9	3878	2973	3054	3302
10	3772	3226	3248	3415
11	3950	3575	3566	3697
12	4235	3591	3630	3819
Average	**4008**	**3382**	**3505**	**3632**

Table 4: Energy value (Cal/g dry wt.) of different fractional plant parts of *T. arjuna* seedling at different stages of growth

Age (Months)	Leaf	Stem	Root	Average
1	2571	2003	2036	2203
2	3927	2832	2848	3202
3	3360	3146	3855	3454
4	3670	3641	4028	3780
5	3998	3593	3953	3848
6	4175	3689	4084	3983
7	3945	3547	3937	3810
8	3867	3590	3770	3742
9	3978	3584	3762	3775
10	4098	3711	3699	3836
11	4240	3824	3856	3973
12	4221	3878	3799	3966
Average	**3837**	**3420**	**3635**	**3631**

This work deals with the energy fixation, accumulation and distribution in the individuals of different age groups of *Albizzi alebbek*, *Dalbergia sissoo*, *Terminalia arjuna* seeding and in their seeds also. The energy content of the seeds of *Albizzi alebbek*, *Dalbergia sissoo*, *Terminalia arjuna* is tabulated in table 1.

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