MODERN PROPAGATION TECHNIQUES -
A CONSERVAION TOOL FOR CERTAIN ENDEMIC
MEDICINAL PLANTS IN NILGIRI BIOSPHERE RESERVE

S. PAULSAMY AND K. ARUMUGASAMY
Department of Botany, Kongunadu Arts and Science College, Coimbatore -641 029.

ABSTRACT: There plant species of medicinal and vegetational fire break importance such as Berberis tinctoria, Elaeagnus kologa and Rhodomyrtus tomentosa were identified in Nilgiri Biosphere Reserve and their eco-physiological behaviors were analysed. The study revealed that generally all the these species were having shorter period of seed dormancy, poor viability of seeds and higher mortality of saplings. These poor eco-physiological features are the major factors for their limited distribution, lesser population and weaker establishment. Hence to overcome these factors the modern reproductive strategies like tissue culture techniques are suggested.

INTRODUCTION:

Nilgiri Biosphere Reserve (NBR) is located in the Western Ghats between the co-ordinates of 76o-76o 45’ E and 11o 15’ – 12o 15’ N lying at the trijunction of the three states of Kerala, Karnataka and Tamil Nadu and covering an area of about 5520 sq. km. Many indigenous and exotic endemic plants of greater economical importance are harbouring this region. Due to the poor ecological and physiological behaviors some of them are restricted in their distribution. To achieve good conservation and management of such plants, we should know their eco-physiological characterstics. The present study heales with the determination of period of dormancy and percentages of viability and mortality of certain such plants in that area.

MATHERIALS AND METHODS:

Field visits were made at monthly interval over a period of one year (April; 1998 to March 1999) in Nilgiri to explore the evergreen herbaceous/- shrub species. Two kg seeds of some selected plant species such as Berberis tinctoria, Elaeagnus kologa and Rhodomyrtus tomentosa were collected during the seed maturation period (March 1999).

The dormancy of seeds was determined by trying to germinate 100 randomly selected seeds at five days interval. The viability of the seeds was determined by germinating 100 randomly selected seeds over moist filter paper in Petri dishes. To determine the mortality rate of the saplings, nurseries were raised. About 1 kg of good quality seeds in each species has been treated in cow dung slurry for 24 hours and sown in the mother bed of 1xo.5m Size. The mother bed was prepared in moist chamber by mixing the components viz., sand, composite and soil in the proportion of 1:1:1. Watering was regularly done at the rate of twice per day. After 30 days, at two leaves stage the seedlings were transferred to the polythene
bags) 16x30 cm) at the rate of 1 seedling per bag and they are being maintained in open sun. After 80 days the mortality rate was calculated on the basis of number of existing saplings. Triplicates were maintained for the experiments.

RESULTS AND DISCUSSION:

In the shoals and other forest types of Nilgiri Biosphere Reserve enormous medicinal plants are inhabiting and their survivability is highly depending upon the ecological behaviors like dormancy, viability, mortality distribution, competition establishment etc. some important species such as Berberis tinctoria Lesch., Elaeagnus kologa Schlecht and Rhodomyrtus tomentosa Wt. despite their medicinal an other importance, possessed low eco-physiological attributes.

The species, B. tinctoria belongs to the family Berberidaceae is distributed above 6000 feet altitude in Nilgiris and Pulney hills; the species E.kologa, a member of Elaeagnaceae family is distributed above 5000 feet altitude in shoal margins and open scrub forests of Nilgiris. Similarly, the Myrtaceae member, R. tomentosa is also distributed above 5000 feet altitude but in the open downs of dry slopes in Nilgiris (4).

The roots of B. tinctoria are used for curing jaundice and controlling cancer also to some extend (1). The fruits of E.Kologa are edible and rich in iron content (6) and the roots produced nodules. The tender leaf and fruits of ; R. tomentosa are used to control dysentery and diarrhea (7). In addition, it could be known that all these three species in general and R. tomentosa in particular can control the spread of surface fire effectively in the grasslands of Nilgiris through raising vegetational fire breaks by using them (8).

Dormancy is the property of many seeds that enables them to survive conditions hazardous to plant growth and to germinate at some later time or in some other place (2). The dormant period of the three species is 30 days for B.tinctoria and R.tomentosa and 45 days for E.kologa (Table 1). The existing of short dormant period naturally reduced the number of viable seeds and consequently limit their distribution(3). The percentage of viability is varied between 30 and 80 across the species (Table 1). The occurrence of lower viability (30% for R. tomentosa and 65% for E.kologa) for these species is a negative factor disturbs the future infestations (5).

The mortality rate of saplings is also higher (>50%) and is of common fact that it would reduce the density and establishment of the species in their habitats. In this juncture, to overcome the poor eco-physiological characters and hence the better conservation and sustainable utilization these medicinal plants, mass multiplication through some techniques like tissue culture etc. and the seedling establishment in their respective habitats are suggested. Further, this would ensure the improvement of biodiversity also to some extent.

ACKNOWLEDGEMENT: The authors are thankful to the Ministry of Environment and Forests, Govt. of India, New Delhi for financial assistance to carryout the work.

REFERENCES

1. Anonymous, the Wealth of India, Raw Materials, Council of Scientific and Industrial Publication and Information Directorate, New Delhi, Vol III, 113, (1952).
2. Chancellor, R.J. Dormancy in weed seeds. Outlook Agric., 11:87 (1982).

3. Egley, G.H. ethylene stimulation of weed seed germination, Agric. For Bull. Univ. Alberta, 5:13 (1982).

4. Gamble, J.S. and C.E.C. Fisher. The flora of the Presidency of Madras. Part 1-11 (Part 1-7 by Gamble and 8-11 by Fisher). Adland and Sons Ltd., London (1915-1936).

5. Harper, J.L. Population Biology of plants Academic Press, New York (1977).

6. Jain, S.K. Dictionary of Indian Folk medicine and Ethnobotany, Deep Publications, New Delhi (1991).

7. Kirtikar, K.R. and Basu, B.Z. Indian medicinal Plants, L.M. Basu, Allahabad, India (19933).

8. Paulsamy, S and K.Arumugasamy. Evaluation of fire retardant species to form vegetation fire breaks in Grass Hills, The Western Ghats. Final Technical Report of R&D project, Ministry of Environment and Forests, Govt. of India, New Delhi (2001).

**Table 1.** Period of dormancy and percentages of viability and mortality of the species, Berberis tinctoria. Elaeagnus kologa and Rhodomyrtus tomentosa.

| Attribute       | Species          |            |            |
|-----------------|------------------|------------|------------|
|                 | B.tinctoria      | E.Kologa   | R. tomentosa|
| Dormancy (days) | 30 ± 4           | 45 ± 5     | 30 ± 4     |
| Viability (%)   | 80 ± 6           | 65 ± 6     | 30 ± 4     |
| Mortality (%)   | 60 ± 5           | 50 ± 4     | 65 ± 7     |

± indicates the SD