Nursery technique of *Pistacia integerrima*
(Kakarsinghi)

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Description:

- *Pistacia integerrima* (Stew ex Brandis) is globally distributed in the Hindukush Himalayan range across Afghanistan, Pakistan, India and Nepal between altitude ranges of 600 - 2400 m.
- Within India, it is scattered throughout the outer ranges in North - west Himalayas from about 400 - 1800m elevation.
- It is indigenous to India and belongs to family Anacardiaceae.
- This species is dioecious in nature.

Uses:

- It is widely used to cure cold, cough, asthma, fever, vomiting, diarrhea, hepatitis, liver disorders, Jaundice, snake bites, as anti - inflammatory, anti - diabetic, blood purifier and gastrointestinal disorders..
- The galls and bark contains a number of secondary metabolites having analgesic, anti - microbial, anti - bacterial, anti - asthmatic and anti - inflammatory activities.

Seed germination:

- Fresh fruits of *P. integerrima* were collected from different locations of Chakrata forest division in the month of June - July, 2022. The fruit are an oblique drupe.
- For seed processing, fruits were cleaned with tap water and seeds were extracted from the fruits with the help of wire net and laid in a mono - layer fashion in the shade.
- On an average, the 100 seeds weight was recorded (6.28g) and 15,948 numbers of seeds per kg was also recorded.
- Seed germination test were conducted as prescribed by International Seed Testing Association (ISTA, 2010). Seeds were placed in germinator at 30ºC temperature.
- Seed germination was completed within six weeks with 26.68 per cent mean germination was recorded in nursery. However, the seeds were soaked in conc. sulphuric acid for 20 minutes and also treated with gibberellin (500 ppm) and gave 70.14 per cent mean germination under controlled.

Air - layering:

- Poor seed setting, low germination per cent, infertility and rooting in branch cuttings were some of the difficulties which encourage the propagation of Kakarsinghi (*Pistacia integrrima*) species using Air - layering method.
- Air - layering trial on this species carried out during the month of September, 2021 in Chakrata Forest Division on natural population.
- For this experiment, young, healthy, vigorously branches of same maturity stage having the diameter of about 1.0 cm were selected. Leaves on the selected branches were removed above and below the point where the cut was made (55.0cm below the shoot tip).
- Branches were injured by removing a 2.0 - 2.5cm length ring of the bark and cambium layer by making two parallel cuts and by joining those cuts with a single transverse cut.
- 1000ppm. - 10000ppm Indole Butyric Acid (IBA), Indole Acetic Acid (IAA), Naphthalene Acetic Acid (NAA) and Thymine in the form powder directly applied on the wound using a sterilized brush.
- Treated wound sites were enclosed with moss - grass (about two handfuls) moistened with water by placing around the treated area and wrapped with low density polyethylene (150 gauges) sheet.
- Layers were tightly secured with polythene by cotton strings to avoid the escape of moisture. In this experiment, there were total of eleven treatments including control and in each treatment twenty five shoots were air - layered randomly.
- First observation on air - layered branches was recorded after 120 days of setting the experiment.
- Profuse rooting (62.86 %) was observed in air- layers with 5000ppm Indole Butyric Acid (IBA) in monsoon season.

- The rooted air layers after detachment from the mother plants were transplanted in poly ethylene bags in the growing medium containing sand, soil and farmyard manure (FYM) mixture in the ratio of 1:1:1.
- It is evident from the results of the experiments conducted in the field/ natural conditions that shade was essential for the success of the air - layers.
- Direct sun light not only dries off the medium used for the layer but injures the delicate root tips as they peep out of the layers.
- The best results were therefore obtained in layers which were under full shade throughout the day .
- The results of the study showed that air - layering method was a potential, viable and economical method of vegetative propagation for Kakarsinghi (*Pistacia integerrima*) species.

Branch cutting:

- Vegetative propagation by different type of cutting in different seasons (rainy and winter) has also been investigated in this species. For branch cuttings viz hardwood, semi-hardwood softwood and coppice shoots were taken.
- One-year old coppice shoots were collected from the young natural population in rainy and winter seasons. Twenty five cuttings (10 - 15 cm length with thickness 1.50 - 2.0cm for hardwood and semi - hardwood) and 0.80 -1.0cm for softwood and coppice cutting) were used in each treatment. The basal part of each cutting was cut saliently.
- Cuttings were treated with different concentrations with 1000ppm-10,000ppm root promoting hormones i.e., Indole Butyric Acid (IBA), Indole Acetic Acid (IAA), Naphthalene Acetic Acid (NAA) and Thymine.
- It is evident from the result that the coppice shoots in this species performed well with 5000ppm Indole Butyric Acid (IBA) and produced more rooting per cent as compare to other cuttings. It is also noticed that rainy season performed better for rooting per cent in this species.

GLIMPSES OF EXPERIMENT

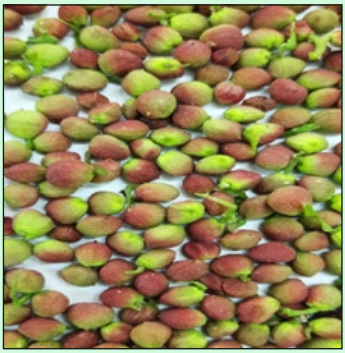

Fig: 1.
Fruits of *Pistacia integerrima*

Fig: 2.
Seeds of *Pistacia integerrima*

Fig: 3.
Seed germination

Fig: 4.
Air - layering in *Pistacia integerrima*

Fig: 5.
Air - layering in *Pistacia integerrima*

Fig: 6.
Air - layering in *Pistacia integerrima*

Fig: 7.
Air - layering in *Pistacia integerrima*

Fig: 8.
Rooting by air – layering in *P. integerrima*

Fig: 9.
Plants propagated by Air – layering

Fig: 10.
Plants propagated by Air – layering

Fig: 11.
Plants propagated by Air – layering

Fig: 12.
Plants propagated by Air – layering

Fig: 13.
Roots development

Fig: 14.
Roots development

Fig: 15.
Branch cuttings treated with hormones

Fig: 16.
Planting of branch cuttings

Fig: 17.
Sprouting of branch cuttings

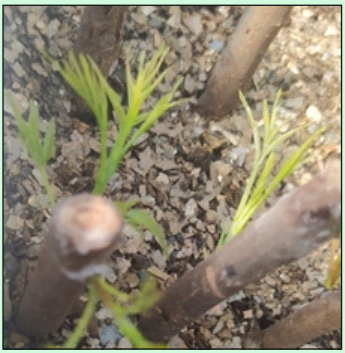

Fig: 18.
Sprouting of branch cuttings

Fig: 19.
Rooting initiation

Fig: 20.
Rooting initiation

Fig: 21.
Rooting initiation

Fig: 22.
Rooting initiation