# IN VITRO MICROPROPAGATION OF MEDICINAL PLANT *ADENANTHERA PAVONINA* L.

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**ABSTRACT**

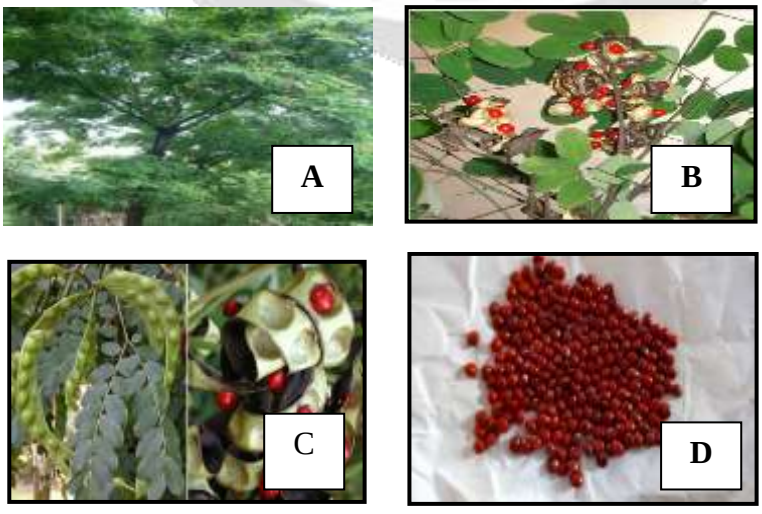
*In vitro micropropgation of medicinally important plant Adenanthera pavonina L. was achieved through different explants. Such as apical shoot, nodes, leaf etc. Different types of media (Murashige and Skoog, 1962) were prepared according to various concentrations of growth regulators The explants were culture on MS medium supplemented with different concentration combination of different growth regulators such as Kinetin, BAP, NAA, IBA, 2,4-D. Maximum percentage of shootlet formation was achieved on medium with combination of NAA and BAP. Maximum percentage of root formation was done on MS medium with IBA and 2,4-D. Regenerated plants were acclimatizing in green house condition. After acclimatizing regenerated plants were successfully transferred to soil.*

**KEY WORDS** *MS medium: Murashige & Skoog Medium, 2, 4-D: diclorophenoxyacetic acid, BAP: 6-benzylaminopurine, IBA:Indole -3-butyric acid, NAA: Naphthalene acetic acid, callus, kinetin.*

## INTRODUCTION

*Adenanthera pavonina* is commonly called Red Lucky Seed. It is also known as a "food tree", its seeds are often eaten by people. *Adenanthera pavonina* L**.** is a perennial and non-climbing species of leguminous tree.Nutritional have proven one quarter of the seed to be oil with a high percentage of proteins (Burkill, 1966). Leaves are compound bipinnate. Flowers borne in narrow spike like racemes, green pods that turn brown, coil up and split open as they ripen to reveal small bright red seeds. This tree is useful for nitrogen fixation, and it is often cultivated for forage, as an ornamental garden plant or urban tree, and as a medicinal plant. For example, the young leaves can be cooked and eaten. The raw seeds are toxic, but may be eaten when cooked. Its uses include food and drink, traditional medicine, and timber (Bisby F 1994). This tree is used for making soap.

Red powder made from the wood is used as an antiseptic paste. seeds are used to treat inflammations (Arzumand ara, *et al.,* 2012).Decoction of the leaves is used to treat gout and rheumatism. Bark was used to wash hair. Young leaves can be cooked and eaten, but usually only during famine. Leaves are used as a supplement for animal. Seeds are roasted or boiled and then eaten with rice which tastes like soy bean. Cooked seeds are rich in oil and proteins and can be easily digested by both humans and livestock. Seeds are curiously similar in weight . Four seeds make up about one gramme. Ground seed can produce an oil which was used as an industrial lubricant. Original Sindur which Indian women wear in their forehead is made from this bead. The seeds are ground and mixed with water and borax to manufacture a type of cement. The seeds are also used as beads in necklaces and bracelets (Hoyos 1979, Kostermans 1980, Little and others 1967). The pulp of the fruit is used for medicinal purposes.




**A.Morphology B. Leaf and Pod C. Dehiscence Pod D. Seeds**

**MATERIALS AND METHODS-**

The plant material was collected in the month of November and December from Dr. Panjabrao Deshmukh Krishi Vidyapeeth [PDKV] Akola [MS].The specimen was identified by a Dr. S.P. Rothe, Head and Professor Department of Botany , Shri Shivaji College of Arts, commerce and Science Akola.

**PROCEDURE FOR SURFACE STERILIZATION**

The procedure was performed in laminar air flow cabinet to maintain aseptic conditions through out the experiment. The various explants were surface sterilized with 70% alcohol for nearly 4 minute. Then the explants were immersed in 0.1% mercuric chloride ($HgCl_2$) for 3 minute, followed by rinsing with sterile double distilled water for 3-4 times. Then explants were soaked by placing them on sterile filter papers (tissue paper) and the inoculated on M/S medium containing different concentrations and combinations of growth regulators.

**PREPRATION OF MEDIA**

The media was prepared in sterile double distilled water by adding desired supplements such as, concentrated stock solutions of macronutrients, micronutrients, iron and organic supplements with various combinations and concentrations of plant growth regulators. Plant Growth Regulators as per the requirements were added after the MS basal media attains room temperature. The (pH) of the media was adjusted to 5.8. The Sucrose 3% was added as carbon source and dissolved properly. Finally agar was added to the media and volume made upto 1000ml by using double distilled water. The media was then boiled to melt the agar. Explant were inoculate on MS medium supplemented with sucrose, agar and different concentration and combination of Kinetin , BAP, NAA ,IAA and IBA. The Hydrogen ion concentration (pH) of the medium was adjusted to 5.8 before autoclaving at 121$^{o}$C for 15min. The cultures were incubated at 25+2$^{o}$C under cool fluorescent light.

**CULTURE CONDITIONS**

All the standard physical conditions were provided to culture in-vitro. The cultures were kept at 25±2$^{0}$C and 70% humidity. Observations were recorded after the initiation and induction of callus and shoots.

**OBSERVATIONS AND RESULTS**

**Table1:Callus obtained from various explants (Node and Internode) for *Adenanthera pavonina* L.**

| Growth Regulator | Con. (mg/ L) | Shoot length(cm) | | | | |
|---|---|---|---|---|---|---|
| | | 15 day | 25 day | 35 day | 45 day | Average length(cm) |
| **NAA+Kinetin** | 6+3 | Initiation of Callus from internode | Callus Green colour Hard | Callus Pale Green toYellow colour Hard | - | - |
| **IBA+ Kinetin** | 5+2 | Initiation of Callus from node | Multiple shoot induction 0.8 | 1.0 | 1.3 | 0.7 |

However initiation of callus was obtained by inoculating inter nodal part as explant of .*Adenanthera pavonina* L. in MS Media with various combination and concentration of Growth regulators such as NAA+ Kinetin in combination of 6+3 mg/lit, high concentration of NAA in combination with low concentration of Kinetin gives callus initiation.

**Table 2: Shoot length from various explants(apical shoots) *Adenanthera pavonina* L.**

| Growth Regulator | Con (mg/L) | Shoot length(cm) | | | | |
|---|---|---|---|---|---|---|
| | | 15 day | 25 day | 35 day | 45 day | Average length(cm) |
| **BAP+IBA** | 4+3 | Callus Initiation | Callus Pale Green to yellow colour Hard | Callus Light Brown Colour Hard | - | - |
| **BAP+IAA** | 2+5 | Callus Initiation | Multiple shoot induction | 0.9 | 1.5 | 0.8 |

However initiation of callus was obtained by inoculating apical shoots ,inter nodal part as explant of *Adenanthera pavonina* L. in MS Media with various combination and concentration of Growth regulators such as BAP and IBA in combination of 4+3 mg/lit, high concentration of BAP n combination with low concentration of IBA gives callus initiation. And in BAP and IAA, IAA in high concentration than BAP in low concentration that is 2+5 mg/lit results in formation of callus and from callus there is formation of multiple shoot initiation .

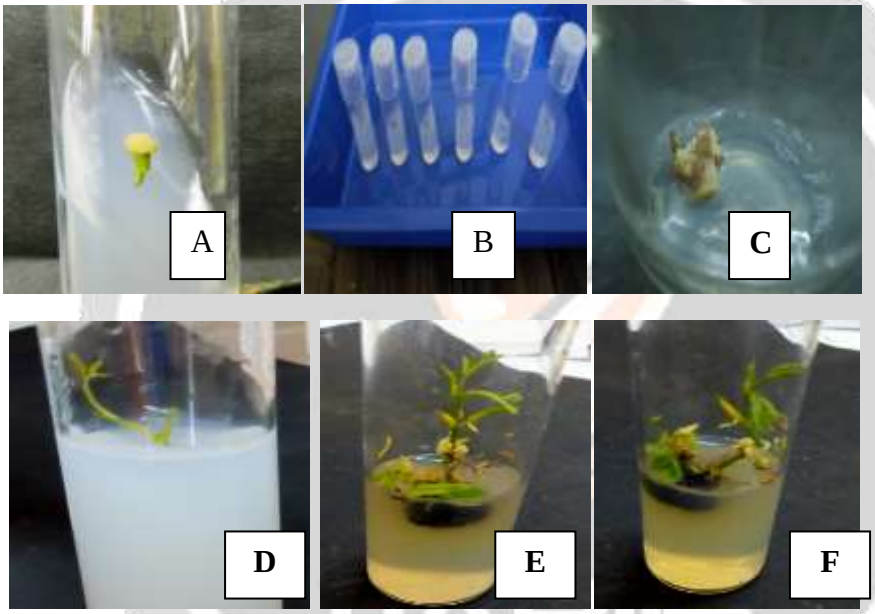



Fig: A, B, C. Initiation of callus. D, E and F multiple shoot initiation from different explants of *Adenanthera pavonina* L.

**CONCLUSION**

From the above investigation it is concluded that the micropropagation studies carried out in *Adenanthera pavonina L* .shows good quality of plants reproduced from the various types of explants. The plants reproduces are quite healthier. The method of micropropagation is also useful for the *ex situ* conservation of *Adenanthera pavonina* L. Before the investigation there is no such protocol for the micropropagation of *Adenanthera pavonina* L. The established propagation protocols can be effectively utilized for commercial and experimental demonstration for the *Adenanthera pavonina* L. Such protocols are utilized for large scale production of plantlets.

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