Propagation of *Sedum adolphii In vitro*

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Abstract

Sedum adolphii stem cutting 1-2 cm were sterilized and cultured on different media . The favorable medium for callus formation was Murashige and skoog (MS, 1962)supplemented with Banzylaminopurine (BAP) plus Naphalene acetic acid (NAA) in10^{-6}M each . Whereas, the best medium for differentiation was MS ,1962 supplemented with BAP 10^{-7}M and NAA10^{-7}M . The formed shoots were transferred to media without Auxin (control) or with different (NAA) concentrations ($10^{-6}$and 10^{-7}M) . The best rooted shoots were on control, transferred successfully to jeffy 7 discs and to the green house after 3 weeks.

Introduction

Sedum plant is one of Crassulaceae family which is called Orpine family . The plant sin this family is characterized to have succulent leaves , in some species they hold beautiful flowers. The family distributed all over the world, and contains 25-36 genera and about 1500 species , most of them are perennial, and few are annual or biannual. The height of these plants are 2.5 cm to shrubs. (1).

Sedum genus grows in the north half of the earth. It's plants grow in several environments from the seashore to the mountains. Many species in this genus are mixed in the nurseries, almost all of them are used as ground cover.

Sedum adolphii is an erect plant 15 cm height with a succulent shoots and leaves . The leaves are waxy with bronze to yellow color if they exposed to direct sunlight and green in shadow. Flowering in these plants needs cold treatment around 10° C . The flowers are small, white emerge in spring(2) Normally such plant is propagated by soft cutting . Previous studies revealed a good regeneration ability for *S. telephium* in culture(3). In general this ability reduced as the time pass in culture while in some species it's continued for several passages (4,5).

Media components and kind of plant growth regulator are found to be very effective in continuing regeneration ability (6).

Due to very rare research on this plant , the gool of this study was to design a medium to produce high percent of regeneration and great number s of healthy plants for *S.adolphii* stem cutting .

Material and Methods

1. Media preparation: MS(1962) salts were prepared as in imperial Lab. Company cataloque. 30 g/l sucrose and 7g/l Agar were added . pH was adujusted to 5.7 ±1 before autoclaving.
2. Environment control: Culture glasses were incubated in an air conditioned room with 25±2 ˚C and fluorescent light 600 foot /candle for 10 hours / day (S.D), and 24 hours (C.L).
3. Explants used:1-2 Cm stem sections cut , sterilized in 1-2% NaOCL for 10-12 minutes, then, washed in sterilized distlled water 3 times for 5 minutes each time .
4. Treatments used: Sterilized segments with cut ends were cultured on medium prepared as above in addition to kinetin (10^{-6}M) and 2,4-D 10^{-6}M in continues light. The explants then, were transferred to medium with BAP10^{-6} M and NAA 10^{-5}M . The new buds and callus which were formed on this medium were transferred to different constrations of BAP and NAA in separate or combination treatments in S.D as in sketch1.The new buds were excited and cultured on medium , without plant growth regulators or with NAA 10^{-6},10^{-7} M for rooting . The calli were transferred to different concentrotion of plant growth regulators as in sketch 1 , and buds produced from them were rooted . In all treatments cited above six replicates were used.

Results and Discussion

Explants were cultured on MS medium with Kinetin 10^{-6}M and 2,4-D 10^{-6} M in the beginning of the experiment. Callus and shoots which produced were grown towards the medium , because of 2,4-D which impair the middle Lamella of these cells (3). Later experiments of the explants were transferred to MS medium plus BAP10^{-6} and NAA^{-5} M to avoid 2,4-D

Fig (1) showed that callus produced in all cytokinin treatments with no regard to auxin concentrations. Callus quantity was inversely proportional with cytokinin concentrations. However, no shoot regeneration is occurred in high cytokinin and the tissue turned brown . This color of the tissue may be due to hormone breakdown and not to a tissue death, as when brown tissue left longer in culture new shoots appeared. This indicates that this plant has a high genetic ability of regeneration in low cytokinin concentration . However, this concentration may moderate endogenous auxin/ cytokinin ratio which controls absorbance of alts from the medium(7).

In conclusion MS1962 with low concentration of cytokinin was the best medium for high regeneration ability in *S.adolphii*.

References

1. Martin, M.J. and Chapman, P.R. (1977), Succulents and their cultivation .London Faber and Faber p156-193 .
2. Laurie, A. and Ries, V.H. (1950) ,Floriculture , fundamental and practices . McGraw – Hill book company.P 323.

3. Brando ,I. and Salema (1977) Z.Pflanzenphysiol.Bd.(85s) 1-8.
4. Torry, J.G. (1967), Physiologia plant.20 :269-275.
5. Nickell,L.G.(1967),Proceeding 12th cong.intern.soc. Sugar cane technology(Puertorico,1965)pp.887-892.
6. Vasil , Vimila and Hilderbrandt.(1965) Science N.Y. 147, pp1454-1455.
7. Murashige ,T. (1974), Ann. Rev.phys.25, 135-66

أكثار نبات السيدم خارج الجسم الحي

نبيل خلف العاني

قسم البايولوجي ،كلية العلوم ،جامعة بغداد

الخلاصة

اخذت عقل بطول 1–2 سم من نبات السيدم ووضعت بعد تعقيمها على اوساط غذائية مختلفة وكان افضل وسط لانتاج الكالس هو وسط ميورشج وسكوج 1962 مضافا اليه $BAP10^{-6}$ $NAA10^{-6}$. اما افضل وسط غذائي للتبرعم فكان MS مضافا اليه $BAP10^{-7}$ $NAA10^{-7}$. نقلت الافرع المتكونة على اوساط غذائية بدون منظمات نمو او حاوية على الاوكسين NAA بتراكيز مختلفة ووجد ان افضل الاوساط لتجذير هذه الافرع كانت الاوساط الخالية من منظمات النمو ، اذ نقلت النباتات المتكونة الى اقراص Jeffy 7 ثم بعدها الى التربة بنجاح

Sketch 1 : Different plant growth regulators used in this experiment, In MS media under S.D lighting

3 stem sections

Kinetin 10^{-6}M+ 2,4-D10^{-6}M

BAP10^{-6}+NAA10^{-5}M

Control, BAP10^{-5}M, 10^{-6}M,10^{-7}M,NAA10^{-5}M, 10^{-6}M,10^{-7}M

BAP10^{-5}M NAA10^{-5}M, BAP10^{-5}M NAA10^{-6}M, BAP10^{-5}M NAA10^{-7}M

BAP10^{-6}M NAA10^{-5}M, BAP10^{-6}M NAA10^{-6}M, BAP10^{-6}M NAA10^{-7}M

BAP10^{-7}M NAA 10^{-5}M, BAP10^{-7} M NAA10^{-6}M, BAP10^{-7}M NAA10^{-7}M.

Best shoots to
Callus On BAP10^{-6}M with NAA10^{-6}M and NAA10^{07}M transferred to

NAA10^{-6}M , NAA10^{-7}M, Control.
BAP10^{-6}M, BAP10^{-6}M NAA10^{-6}M, BAP10^{-6}M NAA10^{-7}M,BAP10^{-7}M ,

BAP10^{-7}M NAA10^{-6}M, BAP10^{-7}M NAA10^{-7}M , Control

Best shoots to Control, NAA10^{-6}M, 10^{-7}M

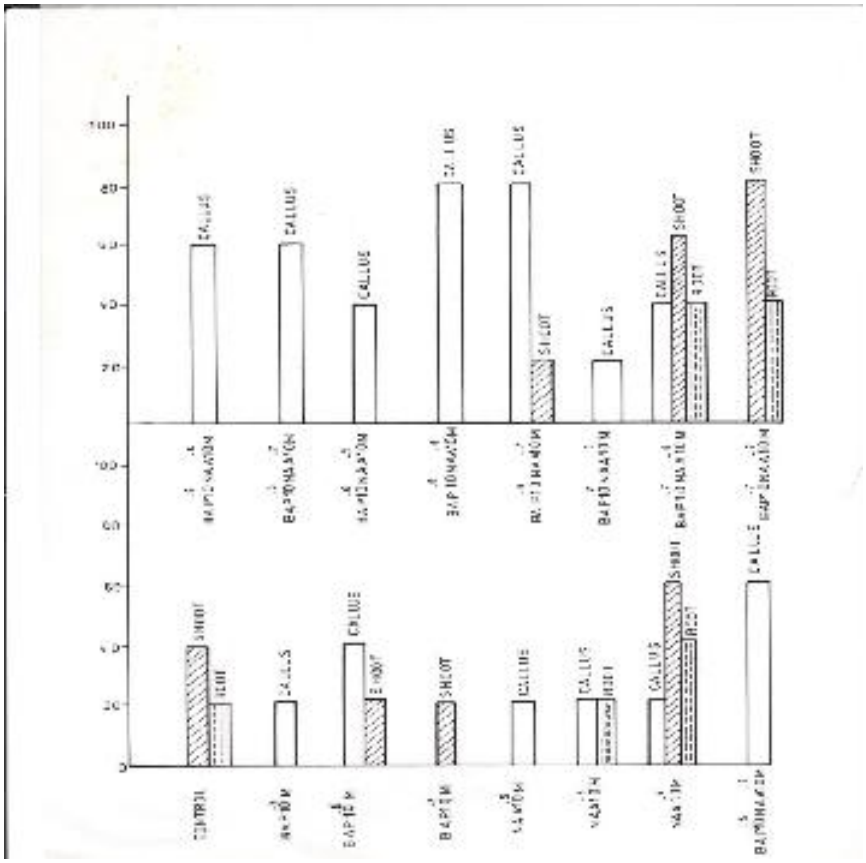

Fig. (1) : percent of callus, shoots, and roots formed in different plant growth regulators