Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 09, pp.8278-8281, September, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

VEGETATIVE PROPAGATION OF *BULBOPHYLLUM CAREYANUM* (HOOK) SPRENG OF SOUTHERN ASSAM

[1*]Borah, N. J., [1]Dutta, B. K., [2]Mazumder, P. B. and [1]Das, A. K.

[1]Microbial and Agricultural Ecology and Biodiversity Conservation Laboratory, Department of Ecology and Environmental Sciences, Assam University, Silchar (Assam), India
[2]Plant Tissue Culture Laboratory, Department of Biotechnology, Assam University, Silchar (Assam), India

ARTICLE INFO

Article History:
Received 15th June, 2014
Received in revised form
22nd July, 2014
Accepted 31st August, 2014
Published online 18th September, 2014

Key words:

Bulbophyllum careyanum,
Conservation,
Growing Conditions,
Southern Assam,
Vegetative propagation.

ABSTRACT

Bulbophyllum careyanum (Hook.) Spreng. is one of the important sympodial epiphytic orchid species among the 700 species of the genus *Bulbophyllum*. It is popularly known as Carey's Bulbophyllum. The flowering season for this orchid species starts from September and ends in December. The flowers last for 15-25 days. Due to its medicinal properties, the tribal people of Southern Assam use the bulb of this orchid species for curing different ailments. Nowadays, population of this orchid species is depleting due to over exploitation, habitat destruction and some other anthropogenic activities. Therefore, some conservation initiatives for this medicinally important orchid species deserve careful attention. Keeping the above in view the present work was taken up with the three different Growing Conditions, i.e. Growing Condition Number 1 (Brick + charcoal + wood (1:2:1) with soil); Growing Condition Number 2 (Brick + coconut husk + charcoal (1:2:1) with leaf mold) and Growing Condition Number 3 (growing on the *Bauhinia variegata* L) were taken into considerations. The results show that all the three Growing Conditions as mentioned above are suitable for the vegetative propagation of *Bulbophyllum careyanum* (Hook) Spreng, which is a medicinally important orchid species of Southern Assam (India).

INTRODUCTION

Orchids, belonging to the family Orchidaceae, are popularly considered as "Gems or Blooming gold" among the cut flowers as well as floriculture industry (Hedge 2012). It is a highly taxonomically evolved plant group among the angiosperms. Due to the shape, colour and their special reproductive structure, this plant group differ from other plant groups of monocotyledons. They are perennial herb either epiphytic or saprophytic (Summerhays, 1951; Holitam, 1953: Campbell, 1964). *Bulbophyllum* is the largest genus of the family Orchidaceae. *Bulbophyllum careyanum* (Hook) Spreng is one of the most important epiphytic orchid species among the 1803 species of *Bulbophyllum*. It is popularly known as 'Carey's Bulbophyllum" with the special characters of single noded pseudobulb, basal inflorescence,and mobile lip. The plant has remote, spherical to oblong, lightly grooved pseudobulbs with a single apical, oblong to linear oblong, leaf. The flowering season is observed to be both winter and summer. It has hanging many flowered inflorescence with lance-shaped floral bracts. Plants are found to be growing in evergreen lowland forest of Himalayas, Assam, Nepal, Bhutan, Sikkim, Myanmar, Thailand, and Vietnam at elevations of 200 to 2100 meters.

***Corresponding author: Borah, N. J.** Microbial and Agricultural Ecology and Biodiversity Conservation Laboratory, Department of Ecology and Environmental Sciences, Assam University, Silchar. (Assam), India*

The local name of the *Bulbophyllum careyanum* (Hook) Spreng in Southern Assam is Ishwarimul. The habitat of this plant species is mainly in wild condition, i.e. different reserve forest of southern Assam.Some of the host plants are *Magnifera indica*, *Artocarpus heterophyllus*, *Lagerstroemia speciosa, Albazzia species, Ficus benghalensis, Lagerstromia reginae*, *Anthocephalus chinensis* (Bhattacharjee, 2009). The plant is very important in Floriculture as well as in traditional medicinal system. Due to their believed medicinal properties the ethnic communities of this region use the pseudobulbs of this orchid species for curing the different ailments mainly hormonal deficiency. The present status of this orchid species is rare according to the earlier report (Das *et al*. 2004; Bhattacharjee, 2009).

Nowadays, population of this orchid species is depleting due to over exploitation, habitat destruction and some anthropogenic activities. One of the interesting character of the orchid species is that in it the natural seed germination is very rare. Due to the lack of endosperm and undifferentiated embryos, the small seeds of the orchid cannot germinate (Sagawa1963). It can be only germinated in artificial media *in vitro*, i.e. micropropagation. Vegetative propagation is the only solution for the conservation of this orchid species. Therefore, in the present work, some initiatives were taken for the *ex situ*

multiplication and conservation of this orchid species. i.e. *Bulbophyllum careyanum*.

Experimental site

The experiment was conducted in the nursury under natural envirоinmental condition and in the green house of the Department of Ecolgy and Environmental Science, Assam University, Silchar.

MATERIALS AND METHODS

Sample collection: The orchid species samples were collected from the wild habitat during the month of June 2012.

The whole experiment was conducted under three growing conditions. The first two conditions were made in the earthern pot culture conditions and the third was done in the branch of a tree species. The details of these condtions are as follows:

1. Growing Condition Number 1: Brick + charcoal + wood (1:2:1) with soil
2. Growing Condition Number 2: Brick + coconut husk + charcoal (1:2:1) with leaf mold.
3. Growing Condition Number 3 : tree trunk of *Bauhinia variegata* L.

In the present work mainly division of orchid plant part were as follows : first the rhizome of the collected samples were divied, having two pseudobulbs and two leaves. Then one divided part was putting in condition no 1 and 2. On the other hand in the condition no 3, the divided samples were tied in the branches of the tree species *Bauhinia variegata L* with the coconut husk and fibre. The experiment was conducted for one year. Regular watering and weed control (in Growth Condition Number 1 and Growth Condition Number 2) were maintained. The first two Growing Conditions (i.e. Number 1and 2) were kept under green house conditon.

Growth parameters

Percentage of survial, days required for flowering, duration of flowering, numbers of capsules formation and number of leaves produced were recorded. The collected data were analyed with the help of Microsoft Excel 2007 and Origin.t test was done for the test of signifiance of the different growth parameters.

RESULTS

All the three growth conditions were found to be successful. From the end of the experiments it has been observed that the percentage of survial (%) in the three different growing conditions were 100 %. On the other hand the other growth parameters differ from one to another. Maximum times was required for the flowering in the Growing Condition Number 3 and the minimum days were required in Condition Number 1. The flower is the most important part in orchid. The experiment shows that Growing Condition Number 1 is the best for the flowering of *Bulbophyllum careyanum* (Hook) Spreng. But the numer of capsules were found to be the highest in Growing Condition Number 3.

Table 1. Percentage survival, Days required for the flowering, Duration of remaining of the flower (days), number of capsule of *Bulbophyllum careyanum* (Hook)Spreng. in different growing conditions, after one year

Growing Condition	Percentage of survival (%)	Days required for flowering (Days)	Duration of remaining of the flower (Days)	Number of capsule
Condition 1	100±0	181.00±4.94*	10.33±0.58**	0.33±0***
Condition 2	100±0	188.33±2.12*	7.33±6.35**	0.33±0***
Condition 3	100±0	206.00±4.94*	3.00±5.20**	0.67±0***

Average,±=SD

*The average values of days required for flowering are significantly different at 0.01 level, t=3.98068, p=0.00406

**The average values of remaining days of flowering are significantly different at 0.01 level, t=3.96914, p=0.00412

*** The average values of number of capsules are significantly different at 0.01 level, t=2.52982, p=0.003524

The numbers of leaves produced among the three different Growing Conditions were found to be varying. The maximum number of leaves were observed in Growing Condition Number 1 and the minimum number was observed in Growing Condition Number 3, by the end of one year.

Table 2. Number of leaves produced by *Bulbophyllum careyanum* (Hook) Spreng. Under different growing conditions (one year observation)

Month of observation	Growing Condition Number 1	Growing Condition Number 2	Growing Condition Number 3
June	2.00±0.00	2.00±0.00	2.00±0.00
July	2.00±0.00	2.00±0.00	2.00±0.00
August	2.00±0.00	2.00±0.00	2.00±0.00
September	2.33±0.58	2.00±0.00	2.00±0.00
October	2.67±0.58	2.00±0.00	2.33±0.58
November	3.00±0.00	2.00±0.00	0.67±0.58
December	3.33±0.58	2.67±0.58	2.33±2.08
January	3.33±0.58	2.67±0.58	2.67±0.58
February	3.67±0.58	3.00±0.58	2.33±1.15
March	4.00±1.00	3.00±0.00	2.33±2.08
April	4.00±1.00	3.3±0.58	2.33±2.08
May	5.33±1.53	4.00±1.00	3.00±2.65

Average,±=SD

The average value of the number of leaves are significantly different at 0.01 level, where t=3.85714, $p=1.91309\times10^{-50.}$

DISCUSSION

The orchid flower is the most beautiful among the flowering plants on the earth. Due to their distinct floral structue , now a days it has the highest demand as cut flowers in floriculture as well as for commercial puposes. *Bulbophyllum careyanum* (Hook) Spreng is one of the medicinally important orchid among the genus *Bulbophyllum*. But the population of this orchid species has declined due to the over exploitation and due to other anthropogenic activity. Although *Bulbophyllum careyanum* (Hook) Spreng is an epiphytic orchid, but it can also be cultivated in pot culture with appropriate culture media. From the present work it can be suggested that it grows well in all that three growing conditions.

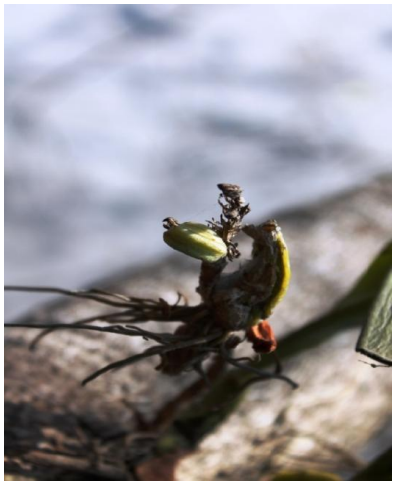
(A)

(B)

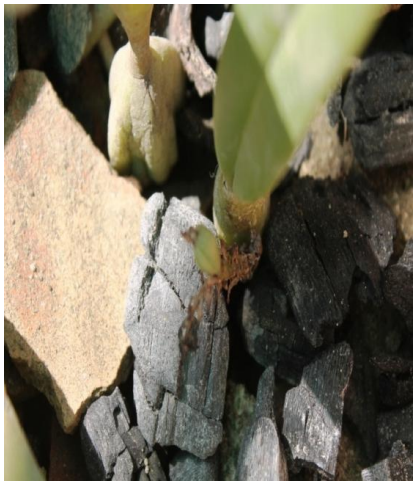
(C)

(D)

Plate 1: *Bulbophyllum careyanum* (Hook) Spreng :
A. Wild habitat B. Growing Condition Number 1 C. Growing Condition Number 2, D. Growing Condition Number 3



(E)



(F)

(G)

Plate 2: Obervation on the growing of capsule in *Bulbophyllum careyanum* (Hook) Spreng:
E. Growing Condition Number 1 F. Growing Condition Number 2, G. Growing Condition Number 3

Growth Condition Number 1 i.e. Brick + charcoal + wood (1:2:1) with soil has been observaed to be the best among the three Growth Conditions taken into consideration in the present study.

Acknowledgment

We are grateful to the UGC for providing financial support (UGC non-net fellowship)

REFERENCES

Bhattacharjee, B. 2009. Studies on diversity of Orchid flora in Southern Assam and their conservation. Ph.D thesis, Assam University, Silchar. (in press)

Campbell, E.O. Nongreen orchids in Newzealand. In. Proc. 4th World Orchid Conference. 291-295.

Das, A.K., Sharma, G.D. and Dutta, B.K. 2004. Study of plant bio diversity and its conservation in Hailakandi District, Assam, India Part I flora. *J. Econ. Taxon. Bot*. 28(1),:213-228

Hedge, S.N. 2012. *Ex situ-in situ* conservation of Orchids in India. J. Orchid Soc.. India. 26 (1-2):1-4.

Holitum, R. E. 1953. Flora of Malaya Orchids. Singapore. Government printing office.

Sagawa, Y.1963. Green Pod Culture. The Florida orchjid list. 6: 296-97

Summerhays, V.S. 1951. Wild orchids of Britain, London

****