

EFFECT OF GROWING MEDIA, NPK FERTILIZATION RATE ON GROWTH OF
ASPIDISTRA LURIDA HORT

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Abstract

Aspidistra Lurida was planted in different soil media. N P K mixture with a ratio of 3:1:2 was applied every 3 weeks at 4 different rates. Peat / sand mixture significantly increased the number of open leaves/plant; total (open and rolled), number of leaves/plant, fresh and dry weight of leaves, fresh and dry weight of the underground organs and pigments content. The number of open leaves or total number of leaves increased steadily with increasing the fertilizer rate, and highest rate (3.6 gm NPK / pot) gave the highest values. However, the fresh and dry weights reached their highest values when the plants were supplied with N P K fertilizer at the lower rates (0.9 and 1.8 gm NPK / pot).

1- Introduction

Aspidistra Lurida is an evergreen, sturdy, long-lived foliage house plant. It is remarkable for its ability to tolerate neglect and to thrive under conditions unacceptable to most kinds of plants. Although extremely tolerant, *Aspidistra* grows best in porous soil enriched with organic matter, and responds to feeding in spring and summer. *Aspidistra* plants grow in dark, shaded areas as well as in filtered sun and can tolerate some drought. These features qualify *Aspidistra* plants to be most useful in places where other plants cannot grow.

Unfortunately, *Aspidistra* plants have a very slow growth rate, and so they take a long time during the production phase till they reach a marketable size. Hornis, 1983, reported that, the larger substrate granules were more favourable for plant growth than small granules.

Increasing the peat moss in the growing media had a favourable effect on the growth of some plants (Blomme and Herregods, 1965, on *Monstera deliciosa*; Kaukovirta, 1968, on *Chrysanthemum*; Beel and Herregods, 1973, on *Sanseria trifasciata*; Poole and Conover, 1982 and 1983, on *Diffenbachia maculata* and *Aglaonema commutatum*).

This study is an attempt to determine the most favourable cultural conditions for planting of *Aspidistra Lurida* such as growth media and NPK fertilization.

2- Material and Methods :

The purpose of this study is to determine the most favourable cultural conditions for *Aspidistra lurida* plants, in order to obtain the fastest growth rate possible. The study began on 14 September 1983, and was ended on 25 July, 1984. The investigation covered the effects of the following factors.

Growing media : Four different media were tested; clay, clay + Peat (1:1), clay + Peat + Sand (1:1:1), Peat + Sand (1:1).

N P K fertilization rate : An N P K mixture with a ratio of 3:1:2 was applied every 3 weeks at 4 different rates (0, 0.9, 1.8 and 3.6 gm / pot).

3- Results :

3.1 Effect of growing media :

3.1-1 Total number of leaves :

Plants grown in the peat / sand mixture gave the highest increase in total number of leaves / plant (Table 1), whereas the lowest increase was obtained from plants grown in clay or in the clay / peat/ sand mixture.

3.1-2 Fresh weight of leaves/plant :

Highly significant differences were obtained in the fresh weight of leaves/plant by using different media. The lowest values was obtained from plants grown in clay. The addition of peat to clay in a mixture (1:1), increased the fresh weight of leaves (of about 25% over the plants grown in clay. Plants grown in the peat / sand mixture gave the highest fresh weight of leaves giving about 60% heavier than that obtained from plants grown in clay.

3.1-3 Fresh weight of underground organs (rhizomes and roots) :

Plants grown in the peat/sand mixture produced the heaviest weight of the underground organs compared with those of plants grown in any other media.

3.1-4 Total fresh weight :

The heaviest plants were those grown in a mixture of peat and sand. On the other hand, the lowest total fresh weight was obtained from plants grown in clay medium.

3.1-5 Dry weight of leaves :

The effect of growing media on this characteristic was highly significant as in the fresh weight. The heaviest weight was obtained from plants grown in a mixture of peat and sand.

3.1-6 Dry weight of underground organs

The dry weight of the underground organs was greatly affected by the growing media, with the differences between plants grown in different media being highly significant. The trend recorded was exactly the same as in the fresh weight.

3.1-7 Total dry weight

The total dry weight of plants grown in a mixture of peat and sand was significantly higher than that recorded for plants grown in any of the other media.

3.1-8 Pigments content (Chlorophyll A, B and Carotenoid, :

The growing media had a considerable effect on the pigments content in the leaves. The highest contents were obtained in leaves of plants grown in a peat/sand mixture. On the other hand, the lowest pigments content was obtained from plants grown in the clay medium.

3.2 Effect of N P K fertilization rate

3.2-1 Total number of leaves

The lowest number of leaves was obtained from the fertilized plants, while the highest was produced by plants supplied with 3.6 gm N P K / pot.

3.2-2 Fresh weight of leaves

N P K fertilization treatments had a highly significant effect on the fresh weight of leaves per plant. The lowest weight was recorded on untreated plants. Increasing N P K rates increased the obtained fresh weight. The highest value was recorded at 1.8 gm N P K / pot, whereas, higher rates (3.6 gm), reduced the fresh weight.

3.2-3 Total fresh weight

Similar trend was obtained as that, obtained for fresh weight of leaves.

3.2-4 Dry weight of leaves

N P K fertilization treatments had a highly significant effect on this character. The maximum weight was obtained at 1.8 gm N P K / pot (23% over the control. Higher N P K rate reduced the dry weight.

3.2-5 Total dry weight

N P K treatments had a significant effect on this characteristic. The untreated plants produced the lowest dry weight; while the heaviest plants were those treated with 0.9 gm N P K, followed by plants supplied with 1.8 gm. N P K.

3.2-6 Pigments content (Chlorophyll A, B, and Carotenoids)

The effect of N P K fertilization on the pigments content varied from one medium to another.

4- Discussion

The best medium giving the highest values for most of the growth characteristics studied, was a mixture of peat and sand at the ratio of 1:1, followed by the mixture of clay, peat and sand at the ratio of 1:1:1. The lowest values were obtained from clay only. This, increasing the percentage of peat in the growing medium had a favourable effect on the growth of *Aspidistra Lurida* plants. A decrease in the clay percentage in the growing medium may cause an increase in the pigments content in leaves of *Aspidistra Lurida*, the lowest pigment contents were obtained in 100% clay, followed by 50% clay (in the mixture of clay and peat at the ratio of 1:1), then 33% clay, while the highest value was obtained in the medium containing no clay. The fresh and dry weight of leaves was the most effective characteristic influencing the total dry weight. The highest rate of fertilization (3.6 gm N P K /pot) gave the highest values for number of leaves.

References

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Table 1 - Effect of growing media on growth of *Aspidistra lurida*

Growing media growth characteristic	clay	clay / peat	clay/peat/ sand	peat/ sand	signific- ance level
Increase in number of open leaves/plant	3.0 a	3.5 a	3.5 a	4.5 b	*
Increase in total num- ber of leaves/plant	3.0 a	3.5 a	3.0 a	4.5 b	**
Fresh wt. of leaves/ plant (gm)	26.7 a	33.4 b	29.8 ab	42.8 c	**
Fresh wt. of under- ground organs / plant (gm)	29.2 a	31.5 a	29.0 a	44.5 b	**
Total fresh weight /plant (gm)	55.9 a	64.9 b	58.8 ab	87.2 c	**
Dry wt. of leaves/ plant (gm)	7.7 a	9.2 b	8.5 ab	12.0 c	**
Dry wt. of under- ground organs/ plant (gm)	6.9 a	6.9 a	6.1 a	9.0 b	**
Total dry wt./plant (gm)	14.6 a	16.0 a	14.6 a	21.0 b	**

Table 2 - Effect of growing media and NPK fertilization rates on the Chlorophyll A, Chlorophyll B and carotenoids contents (mg / gm fresh matter) in leaves of *Aspidistra lurida*

Treatment	Pigment	Chlorophyll A	Chlorophyll B	Total Chlorophyll (A+B)	Carotenoids
Clay	Control	1.66	1.19	2.85	1.00
	0.9 gm/pot	1.40	1.13	2.54	0.92
	1.8 gm/pot	1.06	0.91	1.97	0.72
	3.6 gm/pot	1.19	0.93	2.12	0.83
Clay+	Control	1.49	1.24	2.73	1.11
	0.9 gm/pot	1.64	1.30	2.94	1.08
	1.8 gm/pot	1.54	1.17	2.71	1.03
Peat	3.6 gm/pot	1.72	1.36	3.09	1.17
	Control	1.63	1.07	2.70	0.98
	0.9 gm/pot	1.73	1.10	2.83	1.05
Peat +	1.8 gm/pot	1.86	1.45	3.31	1.10
	3.6 gm/pot	1.66	1.31	2.97	1.20
Sand	Control	1.96	1.53	3.49	1.36
	0.9 gm/pot	2.11	1.64	3.75	1.33
	1.8 gm/pot	1.98	1.50	3.49	1.24
	3.6 gm/pot	2.54	2.04	4.58	1.64

Table 3 - Effect of NPK fertilization rates on growth of *Aspidistra lurida*.

Fertilization Growth rate Characteristic	Control	0.9 gm /pot	1.8 gm /pot	3.6 gm /pot	signific- ance level
Increase in number of open leaves/plant	3.0 a	3.5 ab	4.0 b	4.0 b	**
Increase in total number of leaves/plant	3.0 a	3.5 ab	3.7 b	3.9 b	*
Fresh wt. of leaves / plant	27.6 a	34.1 b	36.4 b	34.6 b	**
Fresh wt. of under- ground organs / plant (gm)	31.1 a	34.9 a	33.9 a	34.3 a	n.s.
Total fresh wt./plant (gm)	58.7 a	68.9 b	70.3 b	68.9 b	*
Dry wt. of leaves/plant (gm)	8.1 a	9.7 b	10.0 b	9.6 b	**
Dry wt. of under- ground organs / plant (gm)	6.8 a	7.6 a	7.2 a	7.2 a	n.s.
Total dry wt./plant (gm)	14.9 a	17.3 b	17.1 b	16.8 ab	*