

THE EFFECT OF CARNATION ETCHED RING VIRUS (CERV) ON GROWTH AND FLOWER YIELD OF DORIS VARIETY OF PINKS (*Dianthus* sp.)

A.M. Abdulmagid⁽¹⁾ and S.M. Robb⁽²⁾

(1) Dept. of Agric. Botany, Faculty of Agriculture, University of Khartoum, Sudan.

(2) Department of Biological Sciences, University of Exeter, England.

Abstract

Abdulmagid, A.M. and S.M. Robb. 1987. The effect of Carnation Etched Ring Virus (CERV) on growth and flower yield of Doris variety of pinks (*Dianthus* sp.). Arab J. Pl. prot. 5: 82 - 81.

In the present study, Carnation Etched Ring Virus (CERV), freeplants of Doris variety of pinks produced by meristem tip culture gained substantially in vigour, number of lateral shoots, total number of flowers, flower quality,

fresh weight and other desirable characters.

Additional key words: Carnation Etched Ring Virus, Doris variety of pinks.

Introduction

Abdulmagid and Robb (In press) described mixed infection of 4 viruses in British pinks (*Dianthus* sp.). The viruses involved were Carnation Etched Ring Virus (CERV), Carnation Latent Virus (CLV), Carnation Ring Spot Virus (CRSV) and Carnation Vein Mottle Virus (CVMV). Although the effect of some of these viruses on the productivity of carnation (*Dianthus caryophyllus* L.) has been reported (2, 3, 4, 5), however little, if not any at all, has been mentioned in connection with pinks. This work evaluated the effect of CERV on vegetative growth and flower productivity of Doris variety of pinks.

Materials and Methods

Planting Material Source: Since completely virus-free planting material was not available commercially and an experiment was conducted to compare the performance of plants of Doris variety fully infected either by 3 viruses, VIZ. CERV, CLV and CVMV, or by two (CLV and CVMV), the latter source was derived by meristem tip culture (1).

A single plant in each case was cloned. 40 cuttings of similar size from each source clone were rooted in John Innes no. 2 compost and pots were placed randomly on the glasshouse bench. They were given a 16-hour day under mercury vapour light bulbs, and when established, their tips were removed, as is done in commercial practice to induce side breaks.

Recording of Data: When the plants were in vigorous vegetative growth and showing incipient flowering (after about 5 months) the number of axillary shoots of 5 cm length and more were recorded for each plant and the flowers picked counted and graded according to rather arbitrary commercial criteria as «special quality» or «ordinary saleable» over the next 6 month. A flower attained «special quality» grade when it satisfied the following characteristics: (1) strong and erect stem, 30 cm or more in length. (2) tidy corolla. (3) absence of split calices or colour break. A flower was categorized as «ordinary saleable» when it showed de-

viation from these attributes. To determine flower size, the diameter of a total of 100 flowers chosen randomly from each treatment over the flowering period was measured. At the end of the growing season the fresh weight of plants in each treatment was weighed.

Results

Data on the different parameter are given in table 1 and analysed statistically using the t-test (6). The total number of lateral shoots was found significantly higher ($P = 0.001$) in CERV-free plants. Usually the shoots were more erect, stronger and broke evenly in this treatment. Flower yield was also greater in the CERV-free treatment, statistically significant at $P = 0.001$ for the number of special quality flowers, $P = 0.001$ for total number of flowers produced, and $P = 0.05$ for ordinary saleable flowers. Over 65% of the special quality flowers were obtained in earlier flushes.

Flower size was not significantly different in the 2 treatments. Furthermore CERV-free plants had a greater fresh weight and was statistically highly significant ($P = 0.01$).

Discussion

Evidence has been presented here that Carnation Etched Ring Virus (CERV) can be a real problem in pinks culture. Trials with CERV-free cuttings of Doris variety indicated the superiority of these over fully-infected counter-parts with regard to growth vigor, multiple and uniform shooting, earlier blooming, increased flower production and improved flower quality. These are all advantages from the commercial standpoint since they lead to better and earlier marketing and therefore greater monetary return.

These findings were supported by subsequent reports from growers in the Exeter area of England to whom these CERV-free stock was released. CERV was also found to be a very serious virus which affects carnations in Denmark (5). In the Netherlands, Hakkaart (3) reported that CERV delayed flowering of the «Jockey» cultivar of carnation, but the most important consequence was the loss resulting from reduced quality.

Table 1. A comparison of growth and flower yield of cuttings derived from CERV-free meristem tip plants and from fully-infected parents of Doris variety.

Treatment	No. of plants compared	Total No. of lateral shoots	Total No. of flowers produced	No. of special quality flowers	No. of ordinary saleable flowers	Total fresh weight in kgs.	Flower diam. in cms. (average of 100)
CERV-free	40	935 ^c	491 ^b	82 ^c	409 ^a	8.16 ^c	4.2
Fully-infected	40	811	438	58	380	6.36	4.1

a, b, c = Significant at P = 0.05, 0.01 and 0.001, respectively.

الملخص

عبد الماجد، أ.م. وس.م. روب. 1987. تأثير الإصابة بفيروس التبقع المحفور للقرنفل (Carnation Etched Ring Virus) على النمو الخضري وإنتاجية الزهور في الصنف «دوريس» لزهرة القرنفل (*Dianthus* sp.). مجلة وقاية النبات العربية 5: 81 - 82

الزهور وزيادة في الوزن الطازج للنبات بالإضافة إلى خصائص أخرى محببة.
كلمات مفتاحية: فيروس التبقع المحفور للقرنفل، قرنفل (صنف دوريس).

أوجد البحث أن معالجة نبات زهرة القرنفل للصنف دوريس (Doris) من الإصابة بفيروس التبقع المحفور للقرنفل (Carnation Etched Ring Virus) عن طريق زراعة القمة النباتية أدى إلى زيادة مضطردة في الحجم الخضري للنبات وعدد الأغصان الجانبية والعدد الكلي للزهور المنتجة مع تحسين في نوعية

References

1. Abdulmagid, A.M. and S.M. Robb. 1985. The elimination of some viruses affecting pinks by meristem tip culture and heat therapy. Arab J. Pl. Prot. 3: 104 - 110.
2. Hakkaart, F.A.. 1964. Description of symptoms and assessment of loss caused by some viruses in the carnation cultivar William Sim. Neth. J. Path. 70: 53 - 60.
3. Hakkaart, F.A.. 1977. The effect of Carnation Etched Ring Virus on the productivity of the carnation cultivar «Jocker». Acta Hort. 71: 191 - 193.
4. Paludan, N. and F. Rehnstrom. 1968. Carnation Mottle

المراجع

1. Virus. Influence on the yield and quality of carnation (*Dianthus caryophyllus*). Tidsskrift for Plantea. 72: 33 - 41.
5. Paludan, N.. 1970. Nellillike-Actsning Virus. Kortaegning, infektions forsog, termoterapi Tidsskrift for Plantea. 74: 75 - 86.
6. Snedecor, G.W. and W.G. Cochran. 1967. **Statistical methods**. The Iowa State University Press, Amos, Iowa, U.S.A. 593 pp.