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**Research Article**

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# Evaluation of rocket salad (Eruca sativa) plants reaction to *Turnip mosaic virus*

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**Abstract** Rocket salad (*Eruca sativa*) is an endemic species of Brassicaceae family and a single year herbaceous plant. Species of the Brassicaceae family may be infected by various viruses. *Turnip mosaic virus* (TuMV) is one of the most important viruses infecting a wide range of plant species, primarily from the family. Experiments were carried out to evaluate the reaction of rocket plants to mechanical inoculation with isolate of the TuMV from Samsun province, the Black Sea Region of Turkey. The experiments were performed in four replications. The saps obtained by grinding TuMV-infected cabbage leaves in 0.01 M phosphate buffer (pH 7.0) were mechanically inoculated to rocket plants using carborundum powder as abrasive. The inoculated plants were maintained in a greenhouse for eight weeks and the symptoms were visually scored according to the disease rating scale (0-9). The average weekly scales were 0, 0.5, 1.3, 1.4, 2.1, 2.8, 3.6, and 4.2, respectively. The mean percentage incidence was 66.7% after eight weeks.

**Keywords** *Eruca sativa*, reaction, rocket salad, TuMV, virus

## Introduction

The groups of crops collectively known as rocket are all members of the Brassicaceae family, and are native to the areas surrounding the Mediterranean Sea [1]. Rocket crops belong to two genera, *Eruca* and *Diplotaxis*, and are increasingly important in the salad vegetable market [2]. The species are now grown commercially all over the world [3].

Rocket (*Eruca sativa*) is an endemic species of Brassicaceae family and a single year herbaceous plant. This species is widely cultivated such Mediterranean countries as Italy, Greece and Turkey in particular (Aegean, Marmara, and Mediterranean regions). Fresh leaves of rocket plant have long been used in salads of Mediterranean cuisine [4; 5]. With the current increase in the consumption of green vegetables which are beneficial to human health, the economic potential rocket plant has steadily increased recently [6].

*Turnip mosaic virus* (TuMV) was found infecting cultivated brassicas and wild and cultivated ornamental *Brassicaceae* plants in different regions of the world [7]. It is among the very few members of the genus Potyvirus displaying a large natural and experimental host range [8]. It is aphid transmitted in the non-persistent mode of plant virus transmission and has a wide range of aphid vectors [9]. In a survey performed in 1987, it ranked second only to cucumber mosaic virus among the most damaging viruses in vegetable crops [10]. In addition to this high economic importance in vegetables, the virus is also an important pathogen in arable brassica crops such as winter and spring oilseed rape [11] and has been reported to infect many plant species in several other families [9]. Five TuMV isolates, originating from different host plant species (*Brassica cretica*, *B. juncea*, *B. napus*, *Eruca vesicaria* subsp. *Sativa*, and *Sisymbrium orientale*), have been identified [7].

TuMV was determined in Brassica vegetables in the Black Sea Region of Turkey [12-14]. The objective of this study was to assess the reactions to TuMV of the rocket salad cultivars from Turkey. Infection time and the severity of symptoms were also evaluated in rocket salad plants.

## Materials and Methods

TuMV was isolated from cabbage and was maintained in rocket plants. The presence of the virus was confirmed by double-antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA) in propagation hosts.

Seeds of cultivar commonly used in rocket-growing were sown on plastic pots with commercial peat and rocket plants were grown in a plant growth room at 24-26°C. Twenty seedlings, using 0.01 M potassium phosphate buffer (pH 7.0), were mechanically inoculated with TuMV. For eight weeks after inoculation (wai), plants were inspected weekly for symptoms. Samples from inoculated and tip leaves were tested by DAS-ELISA. The symptoms on the plants were assessed using the following disease rating scale (0-9) as by [15; 16].

## Results and Discussion

The majority of plants was systemically infected with TuMV and showed mosaic symptoms ranging from mild to severe in intensity, corresponding to those observed by other studies [17-19]. (Figure 1).

*Figure 1: Symptoms on rocket plants inoculated with the TuMV*

The symptom severity score for rocket plants varied eight weeks after inoculation. The average weekly scales were 0, 0.5, 1.3, 1.4, 2.1, 2.8, 3.6, and 4.2, respectively (Figure 2).

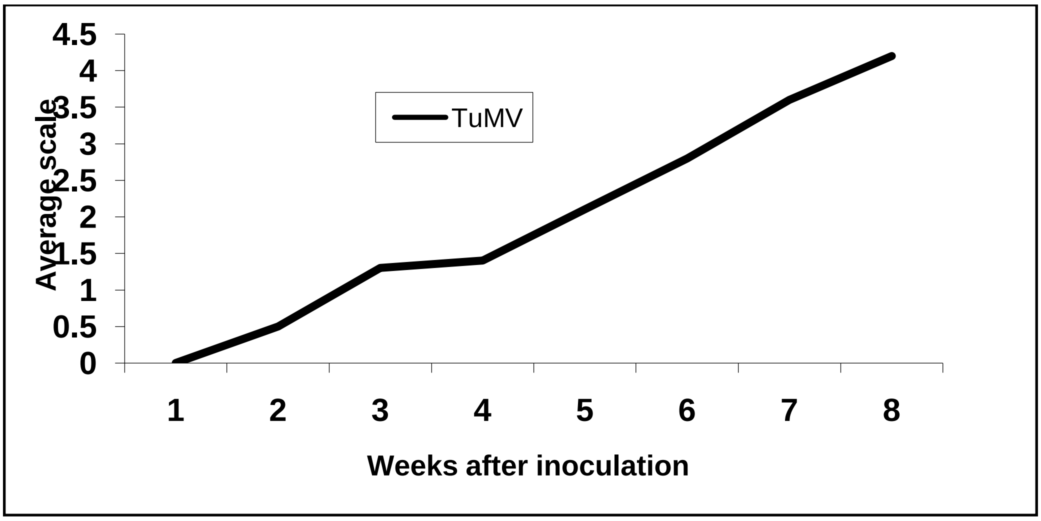


*Figure 2: Infection and development period of the disease after inoculation of rocket plants with TuMV*

The course of symptom expression was assessed and the results of virus detection in symptomless leaves were documented using DAS-ELISA. The mean percentage incidence was 66.7% after eight weeks.

## Conclusion

TuMV is one of the economically most important pathogens in Brassica vegetables. Establishment of resistance to TuMV in white cabbage is an effective way to control this disease [20]. The findings obtained during the study help better understand the native isolates and develop efficient control strategies, and may help to understand the processes leading to the emergence of epidemic outbreaks.

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