agents such as X- and gamma radiations and centrifugation influence the enantiomorphism of plant organs in genetal and seedlings in particular and will pave a way to obtain in desired plant type, since one type of enantiomorph was found to be superior over the other in terms of yield potential.[1,2]

Bahadur and Reddy[7] have opined that the isomerism in the cyathia of *Euphorbia millii* is possibly due to the stereoisomerism of the hormone molecules present in plant system. Hence, radiation and centrifugation possibly disturb the isomeric patterns of hormones which result in alteration of the ratios of the L- and R-handed and neutral seedlings with no overlapping.

Finally, it is of interest to underline the observations of Ono *et al.*[5] According to them, "Further study to clarify the mechanism of the radiations effect may throw more light upon the problem of the right and left-handedness which is ultimately a fundamental problem of morphogenesis."

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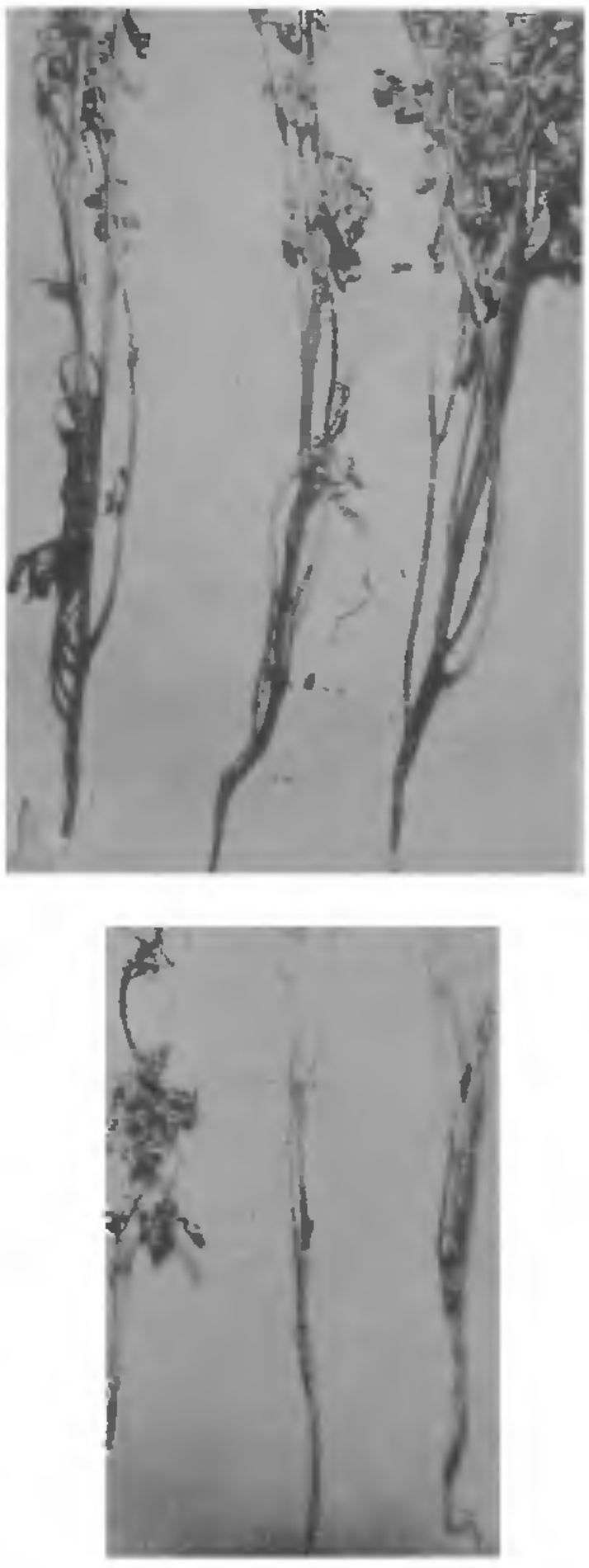
TWO NEW ROOT-ROT DISEASES OF SPICES

D. K. DWIVEDI, D. N. SHUKLA AND S. N. BHARGAVA
Department of Botany, University of Allahabad, Allahabad 211 003, India

WHILE studying the field diseases of spices, two severe root-rots of *Trigonella foenum-graecum* L. and *Coriandrum sativum* L. caused by *Alternaria alternata* (Fr.) Kessiler and *Curvularia pallescens* Boedijn respectively were observed during March and April for the past two years. Frequency of the disease was observed upto 40 and 20% respectively. Younger plants were more susceptible than the older ones. At seedling stage rot was recorded upto 50—75% in both cases. The fields, in which the disease appeared, had sandy loam soil and previously paddy was grown in kharif season in both the years. The disease was severe under heavy irrigation and water-logged conditions.

Root-rot of fenugreek (Trigonella foenum-graecum)

The infected plants show poorly developed roots, finer rootlets are either not fully developed or destroyed due to rotting. Lower leaves of the infected plants gradually lose their green colour, turn pale yellow. Growth of the infected plants remains stunted. Plants are easily detached at soil level when pulled out.



Figures 1-2. Root-rot of **1.** Fenugreek and **2.** Coriander.

Root-rot of coriander (Coriandrum sativum)

Roots become brownish to black and brittle secondary root system totally lacking. Basal portion of the leaves become conspicuous giving pale of sick

appearance to the plants. Severely infected plants show yellowing of tips of young leaves, which gradually spread downwards to the leaf blade. Ultimately the entire plant turns yellow and collapses due to rotting of the basal portion.

The above two root-rot diseases of fenugreek and coriander are *new records for India.*

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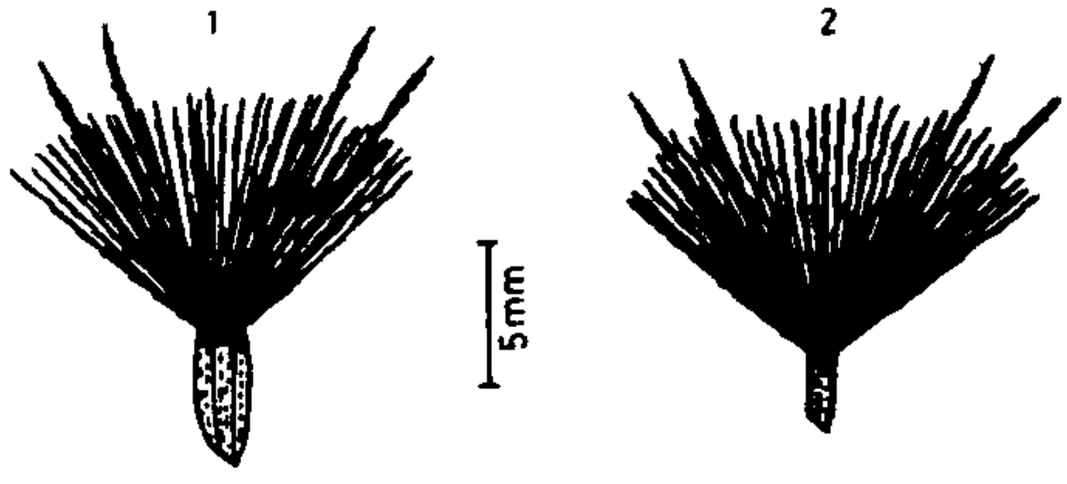

Figures 1–2. **1.** Peripheral and **2.** Central seeds of *Oligochaeta ramosa.*

DIMORPHIC SEEDS IN A CAPITULUM AND DISPERSAL STRATEGIES IN *OLIGOCHAETA RAMOSA* (ROXB.) WAGENITZ

B. K. SINGHAL AND D. N. SEN
Botany Department, University of Jodhpur,
Jodhpur 342001, India

OLIGOCHAETA ramosa is a perennial plant which becomes more conspicuous in Indian desert in late winter and spring when most of other rainy season ephemerals disappear. New seedlings appear after winter rains but old perennating rootstocks sprout just after monsoon rains, and the new aerial branches start bearing flowers early[1, 2]. The adaptive values of seed shape, size and weight may vary to such an extent that reproductive efficiency in a particular habitat would depend upon a compromise among these conflicting demands. Seed shape involves a compromise between the forms most efficient for packing, dispersal and landing while seed size represents a compromise with seed number[3]. The importance of seed size, in relation to survival of seedlings in various environments, was first realised by Salisbury[4]. His studies have been amplified and made more precise by a number of workers[5–8]. Seed colours are generally adaptive in orienting seed predators[9]. Seed outline and weight are adaptive in respect of dispersal mechanism. Heavy seeds with smooth outline are difficult for dispersal, while lighter seeds with conspicuous awns, hairs or projections are easily dispersed[10].

All aspects of dispersal, including dehiscence and structural and physiological devices, are important during migration, succession and evolution. The transformation of calyx to pappus is an adaptive feature in the plants of compositae. The role of involucral bracts, present on the capitulum, and behaviour of pappus during seed dispersal have been studied[11]. Dispersal strategies in plants of Indian arid zone have also been reported[12].

In the present investigation, dimorphic seeds were found in a capitulum of *O. ramosa*. The peripheral and central seeds were collected from the plants growing in cultivated fields. The shape and the colour of the seeds and different types of pappus were observed under dissecting microscope. The number of pappus in each row was noted. Results presented here are the average of 100 observations. For dispersal strategies, two different aspects were emphasized, *viz.*, actual dispersal in the field, and the structural modifications needed to attain this dispersal.

Seeds from the the periphery (figure 1) and centre (figure 2) of a capitulum showed dimorphism. The lengths of the peripheral and central seeds were 5 and 3 mm, respectively. The width of the peripheral seeds was 2 mm at the top and middle and 1 mm at the base, while the central seeds were 1 mm in width from top to base. The weights of peripheral and central seeds were 0.240 and 0.094 g, respectively. The peripheral seeds were somewhat swollen having ridges and furrows (five each) while the central ones had ridges and furrows only (two each). The peripheral seeds were dark yellowish-brown; while the central ones were pale yellowish-brown in colour. Ridges were darker than furrows in peripheral as well as in central seeds. Two rows of pappus were present on the top of both types of seeds. Four pappus, 11 mm long, were noted in the centre; and outer to this a row of 115 pappus, 4–8mm long, was noted. The lower portion of the inner pappus was yellowish, while the remaining portion was colourless. The pappus of outer row were colourless.

In this species, each branch terminates in an inflorescence which is a head. The involucral bracts are multiseriate, the innermost being longest and gradually become shorter outwards. Spiny tips of the outer bracts are bent at right angle to the head, but tips of the inner bracts are very compact. Through a small opening at the top of capitulum some parts of pappus come out. After seed maturation, involucral bracts dry and spread to form a cup-like structure, as a result the pappus get completely exposed. The achenes detach from the torus and the central seeds reach just at the top of the capitulum due to their light weight; while peripheral ones go slightly upwards due to their heavy weight. During the fast currents of wind, the seeds float in the air with the help of pappus and are dispersed to long distances. The central seeds go