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FRUIT HYPERTROPHY CAUSED BY *CUSCUTA*

HENRY LEE DEAN

The writer (1, 2) has recently published certain results of extensive experiments relating to gall formation in host stems following haustorial invasion by *Cuscuta*. Concurrent with these experiments certain host plants were allowed to grow in the greenhouse until flowers and fruits had been formed. Stems of *Cuscuta Gronovii* Willd., growing from adjacent host plants, twined of their own accord around developing pods of the garden pea, *Pisum sativum* L. These plants were left undisturbed until the pods were matured, early in the summer of 1936. Three pods of the garden pea were affected; two on one host, a third on another plant. On one pod the dodder stem made only a single coil but two complete coils encircled each of the other two pods. Haustoria penetrated the pericarp of each pod at points where the close, almost horizontal, coils of the dodder stem pressed tightly enough to stimulate the formation of these organs. Enlargement of the pericarp following haustorial entry formed spirally ascending ridges on each affected pod. A pod bearing two coils of the dodder stem and showing the swelling of this fruit due to haustorial entry is shown in figure 1. This drawing, made directly from a photograph, shows the type of swelling formed on each affected pea pod. Other pods on the same plants were not affected by the dodder, simply because the parasite stems did not happen to come in contact with them. The swollen areas of the pericarp consisted mainly of parenchyma cells, somewhat larger in size than those of an unaffected region of the same pod. The seeds in the fruit directly affected by haustorial entry were noticeably smaller than those in an unaffected part of the pod. All seeds in the parasitized fruits were smaller than those in dodder-free pods.

Two young pods of kidney bean, *Phascolus vulgaris* L., were attacked by the same parasite under similar conditions. Each formed a slight enlargement at points of haustorial entry, but these responses were not as large, proportionally, as the swellings formed on the garden pea. The dodder appeared to grow better upon the pods of the pea than upon those of the bean.

Other fruits experimented upon were cucumber, *Cucumis sati-*

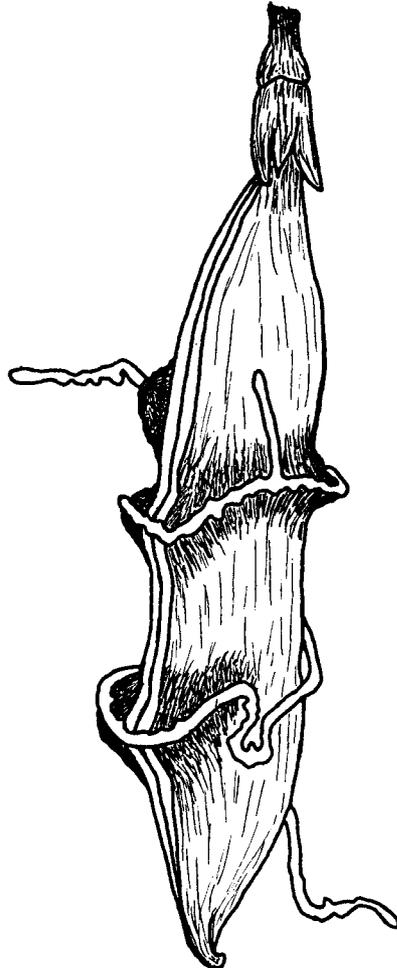


Fig. 1. *Cuscuta* twining around pod of garden pea. Enlargement under the stem of the dodder due to haustorial entry. Drawn from a photograph.

vus L., and squash, *Cucurbita Pepo* L. The dodder did not grow well upon the cucumber and few haustorial attachments were made. A slight enlargement formed at these points, but the results of this infestation were not regarded as entirely satisfactory. The writer believes that further experimentation would probably result in the formation of well-marked swellings on this type of fruit.

The developing fruits of the squash were not naturally attacked, but an attempt was made to infest them by placing the dodder stems around them by hand. The shape of the fruit discouraged

close contact by the dodder coils and the parasite did not establish itself at any one point long enough for haustoria to penetrate. Enlargement would probably result if the dodder were held in contact with this kind of fruit by artificial means until haustoria had penetrated the fruit wall.

LITERATURE CITED

1. DEAN, H. L. Host responses to haustorial invasion of *Cuscuta* species. *Science* 11.80: 588. 1934.
2. ——— Gall formation in host plants following haustorial invasion by *Cuscuta*. *Amer. Jour. Bot.* 24: 167-173. 1937.

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