STUDIES IN THE DISEASES OF MANGIFERA 
INDICA LINN.

II. Effect of Injecting Healthy Mango Fruits with Extract 
from Naturally Occurring Necrotic Mangoes

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Introduction

In a previous paper of this series an account has been given of the external 
symptoms of the necrosis of the mango fruit. The disease which is very 
prevalent in Bihar and the United Provinces first appears as little etiolation 
at the distal end of the fruit. The etiolated area increases in size and inten-
sity and is followed by the appearance of greyish brown spots which coalesce 
to form a continuous necrotic area. The disease advances and considerable 
part of the mango fruit is destroyed. The paper also dealt with a few 
preliminary experiments that had been carried out to find out the organisms 
responsible for the disease. Neither a fungus, nor a bacterium could be 
isolated from the diseased tissue and attempts to find out if the disease could 
be transmitted by inoculating a small piece of the necrotic tissue into the 
healthy mango fruit proved inconclusive. The method adopted for the latter 
experiment was the one developed by Murphy and M'Kay (1926) to infect 
the potato tubers with virus. It consisted in removing a small plug of 
healthy tissue by means of a cork-borer and replacing it by a plug removed 
from the diseased part by means of another cork-borer of next larger size.

In order to find out the immediate cause of the disease a systematic 
investigation was started at this laboratory along various lines. The ex-
periments were designed to produce necrosis by subjecting healthy mango 
fruits to coal gas, sulphur dioxide, carbon monoxide, etc., and by injecting 
the extract from the necrotic tissue into the healthy fruit.

The present paper deals exclusively with the effect of injecting healthy 
mango fruits with extract from naturally occurring necrotic mangoes.

Method and Material

The investigation on the effect of injecting the healthy mango fruits 
with extract from the naturally occurring necrotic mango involved, firstly
the preparation of the extract in complete aseptic conditions and secondly evolving a method of injecting fruits so that the fruits could retain the fluid extract for a relatively longer period.

(a) Preparation of Extract.—Due to the lack of facilities in the department, the preparation of the extract was carried out at the Provincial Hygiene Institute, Lucknow.

Usually about twenty-five mangoes showing advanced stage of necrosis were utilised. The mangoes were first wiped with rectified spirit and the diseased tips separated from the healthy portion with a sterilised scalpel. These tips were crushed in a sterilised juice extractor with 200 c.c. of normal saline. The extract so obtained was filtered through Berfeld's filters with the help of an electric vacuum pump at 10 to 15 mm. pressure. The filtrate was first tested for sterility, by inoculating it into a suitable nutritive medium. It was then filled in 1 c.c. ampoules and sealed in vacuum. Prior to the injection experiment, the sterility of the extract was again tested by similar method.

The extract from healthy tissue was prepared and sealed in 1 c.c. ampoules in the same manner. In this case, however, particular care was taken to collect the fruit samples from localities and trees where necrosis was unknown.

(b) Method of Injection.—The injection experiments were carried out in orchards with mangoes still on trees.

The fruits were first wiped with cotton wool dipped in rectified spirit to effect surface sterilisation.

Earlier attempts to inject the fruits with fluids directly by means of a syringe had shown that not only is it difficult for the needle to penetrate the mango tissue, but also the needle becomes completely blocked up by the tissue with the result that it is impossible to discharge the fluid into the tissue at all. It was therefore necessary first of all to bore a passage by means of a needle in order to inject the extract in the cavity thus formed. For this purpose, the sterilised mango fruit was pierced at a given point by means of a sterile needle (diameter 0.8 mm.). It was, subsequently found convenient to have two such passages intersecting each other at right angles. The first passage AA' was made at right angles to the long axis of the first and the second passage BB' was made perpendicular to AA' and parallel to the long axis intersected each other so that the injection of extract at one end A enabled the extract to permeate the whole passage and reach the interior of the tissue at B'.