Inoculation experiments have been started with young saplings of *D. embryopteris* in the Botanical Garden of University College of Science, Calcutta, in October 1970.

A large number of young saplings, about one and half years old, have been grown in the garden and twelve selected saplings have been inoculated both with the primary and the secondary mycelia of the fungus, six with the primary mycelium and six others with the secondary ones. The rest of the healthy saplings of the same age have been kept as control.

At the time of inoculation, the bark of the main stem of each plant has been superficially sterilized as far as possible by wiping the surface first with sterile distilled water and then with 95 per cent alcohol. The stem has then been inoculated by making rectangular or triangular cuts open towards the base by a sterile scalpel (Heald, 1937). The flap of the bark has been raised up with the sterile scalpel and the inoculum has been placed under it in contact with the living tissue, the phellogen. The raised bark has then been placed in position, covered with moist and sterile absorbent cotton wool, wrapped with a piece of thick sterilized oil paper, and firmly tied with thread at both ends (Plate XX, Figs. 69-74). In case of controls, similar
procedure has been followed but without any inoculum. The moist has been used in order to prevent drying out of both the injured portion and the inoculum. The average temperature during the month of October-November, 1970 has been to be 23-30°C. and the humidity ranged between 50-60 per cent.

After a month the inoculated plants have been examined. All the overlying materials have been removed. It has appeared that, in all cases, the plants have taken up the infection. The bark of each plant has been found to show shrinkage at the place of inoculation, while that in the control plants have been found to be in the process of healing. The wounded portion, after three months has shown the formation of small canker with gaping wounds (Plate XX, Fig. 74). No callus tissue, has however been formed at this stage. The inner wood has been found to be exposed due to destruction of internal living tissues. In both transverse and longitudinal sections of the stem through wounds fungal penetration has been noticed upto depth of 3-4 mm. (Plate XX, Figs. 71-74) while in the longitudinal direction the mycelium has traversed about 1.4 - 1.8 cm. both downwards and upwards from the place of infection. Lateral spreading of the fungus is, however, insignificant. In the controls the living tissue and internal wood remain unaffected.

Careful microscopic observation of the infected areas in transverse, radial longitudinal and tangential longitudinal sections of the stem, when stained with Picro-aniline blue (Cartwright, 1929), reveal mycelial growth below the bark in the cambium and underlying tissues. The presence of the mycelium has been noticed in the phellogen, the phelloderm, the
phloem and the xylem but not in the bark. The mycelium has advanced
from cell to cell, but in case of mature xylem elements it has penetrated
usually through the pits but advancing directly through the walls
forming bore-holes. The cells of the phellogen at places have been
completely penetrated by the mycelium and they have become dead. The
intercellular secondary mycelium has been found characteristically to
posses clamp-connexions while infection with the primary mycelium has
not shown their presence. Lysigenous cavities have been found to be
formed in the xylem due to fungal infection. The fungus advances in two
ways, one laterally through the phellogen and newly formed parenchymatous
cells (Phelloderm) and the other centripetally through the phloem, the
phloem, the cambium and the xylem tissues. The fungus has also invades the
phloem and xylem rays. These facts have shown beyond doubt that the
pathogen has established itself within the host tissues. Although on the
onset it has to fight against considerable resistance by the cells of
phellogen and lignin contents. The hyphal tip at the time of passing
from cell to cell has become attenuated, which after successful pene­
tration swelled and regained its original width. The infected cells,
however, have lost their protoplastic contents. In case of woody elements
numerous bore-holes have been found together with the initiation of
spiral shrinkage cracks (Plate XX, Fig. 73). The lumina of the vessels
has been found to completely filled with mycelial wefts. The mycelium
running through the lumina of the fibres, have been found to be sparingly
branched. A brown zonation in the stem has been formed due to deposition
of gummy substances in the cells bordering the infected region.
After one year, the remaining infected plants have been examined and these have further testified the establishment of the fungus within the host-tissues. These inoculated plants have shown considerable swelling at the places of wounding with prominent canker-formation. Irregular cracks in the bark have been found to extend upwards in the stem from the place of inoculation. In longitudinal section of stem, it has been found that the mycelium has progressed within the woody tissue to a considerable distance. Cross-section of the stem through the infected regions when examined with a lens have revealed the presence of the rot-pockets along the periphery of the woody tissue. At some places, discolouration of the wood has been noticed.

Re-isolation of the pathogen has been done from the infected plant-tissues and all the isolates have agreed closely with the original mycelia in cultural, morphological and microscopic details.

The results, thus obtained from the inoculation experiments, have indicated that the pathogen Hexagonia species is a wound parasite. It is presumed that in nature, the pathogen has entered the host-tissues through some wounds, viz., pruning ends of branches, accidentally broken ends of branches or other wounds. The development of other symptoms and the advanced stages of infection causing decay of wood have not been given here as those symptoms and stages require development and observation for several years which is beyond the scope of the present investigation.