Explanation of Plates

Plate Ⅰ.

1. Typical canker lesion on trunk producing numerous pycnidia.

2－5. Several fruit trees affected by *Valsa ceratosperma*. 2. Peach (Kurakatawase), 3. Aronia, 4. Pear (Misirazu), 5. Pear (Bartlett).

Plate Ⅱ.

1. Vertical section of perithecial primordia embedding host tissue. Note dence cytoplasmic, ascogonium-like hyphae in the primordia. Scale line indicates 40 μm.
2. Vertical section of an immature perithecium. Scale line indicates 100 μm.
3. Vertical section of mature perithecia embedding in host tissue. Scale line indicates 100 μm.
4. Vertical section of a mature perithecium containing asci. Scale line indicates 120 μm.
5. Pycnidia of the pathogen on apple twig, showing extrusion of the spore mass.
6. A perithecial stroma producing ascus balls (allow) on the top of papillae. Scale line indicates 100 μm.

Plate Ⅲ.

1. Projectiles caught on dry slide glass showing ascospore masses with epiplasma (Phase-contrast microscopy). Scale line indicates 50 μm.
2－3. Apparatus used to catch ascospores liberated from stromata on cankered apple trees. 2. Gutter trap with a test tube for spores washed down with rain water. 3. Slide-trap for spores ejected into air.
4. Ascospores and pycnospores caught on a glass slide. Note 8 spores within a projectile. Scale line indicates 20 μm.

Plate Ⅳ.

1－5. Infection sites of Japanese apple canker on the apple trees. 1. Fruit scar (arrow), 2. Pruning wound, 3. Die back (arrow, winter injury), 4. Dead bud, 5. Bark keeping in contact with splint (arrow, apple shoot).

Plate Ⅴ. Longitudinal sections of cankered apple tissues collected in Feb. (1), early May (2, 3) and early July (4, 5, 6, 7). Scale lines indicate 40 μm excepting 4, 6 and 7.

1. Transition zone composed of collapsed cells between infected and healthy tissues.
2. The hyphae developing through the phloem and discoloration of the tissues.
3. Fungal mycelium observed intracellularly in the cortical tissue cells.
4. Flat mass of mycelium (mycelial-fan) invading between periderm and cortex. Scale line indicates 90 μm.
5. Fungal mycelium invading cortex.
6. Mycelial-fan invading wound cork layer consisted of several layers of thin-walled cork cells. Scale line indicates 90 μm.
7. General view of canker margin showing three different zone ; apparently healthy

tissue（H），diseased tissue（D）and the tissue at the transition zone（TZ）between H and D. Scale line indicates 500 μm.

Plate Ⅵ. Longitudinal sections of bark tissues treated with several staining reagents. Scale lines indicate 50 μm excepting 1，2 and 5. Sampling date were June（6），early July（1，2，3，4，5）and August（7）.

1. Cell walls at transition zone formed between diseased and healthy tissues. Stained with phloroglucin-HCl（faint red color）. Scale line indicates 200 μm.
2. Cell walls lignified at the TZ. Stained with shiff's reagent（red color）. Scale line indicates 75 μm.
3. Healthy tissue cells filled with starch grains. Stained with IKI solution.
4. Few starch grains found in cells at the TZ.
5. Oil drops in parenchyma cells where starch grains disappeared. Stained with Sudan black B. Scale line indicates 4 μm.
6. Wound cork layers consisting of thin-walled cork cell formed in cortical tissues. Stained with Sudan black B.
7. Wound cork layers consisting of thick-walled cork cells separating the discolored tissue from healthy one.

Plate Ⅶ. Longitudinal sections of bark tissues collected in August（1，2，3）and in October（4，5，6）. Scale lines indicate 500 μm excepting 5.

1. Wound cork layers consisted of thick-walled cork cells between diseased and healthy tissues. Stained with Sudan black B.
2. Wound cork layers formed scarcely under primary periderm（arrow 1），along bast fiber（arrow 2）and xylem（arrow 3）.
3. Strong wound cork layers formed between mass of mycelium and healthy tissue, suggesting its function as a barrier to mycelial invasion.
4. Invasion by mycelial-fan between periderm and cortex.
5. Mycelial-fan advancing along bast fiber. Scale line indicates 200 μm.
6. Mycelial-fan invading between phloem and xylem.

Plate Ⅷ.

1. A scraping scar showing repeated recurrence of canker.
2，3，Longitudinal sections of canker margin after surgical treatment of canker. 2. The extension of fungus reccurrs from the edge of callus contacting with xylem. 3. The extension of fungus reccurrs from the pieces of dead bark（arrow）sticking to the periphery of callus.

Abbreviation

a, ascus ; ab, ascus ball ; acg, ascogonium-like hyphae ; as, ascospore ; Ba, bark ; bf, bast fiber ; co, cortex ; col, collenchyma ; D, diseased tissue ; g, gum ; H, healthy tissue ; m, mycelium ; mf, mycelial-fan ; nx, new xylem ; o,oil drop ; pp, periderm ; ph, phelloderm, ps, pycnospore ; s, starch grain ; TZ, transition zone between D and H ; wc, wound periderm ; x, xylem.

Plate I

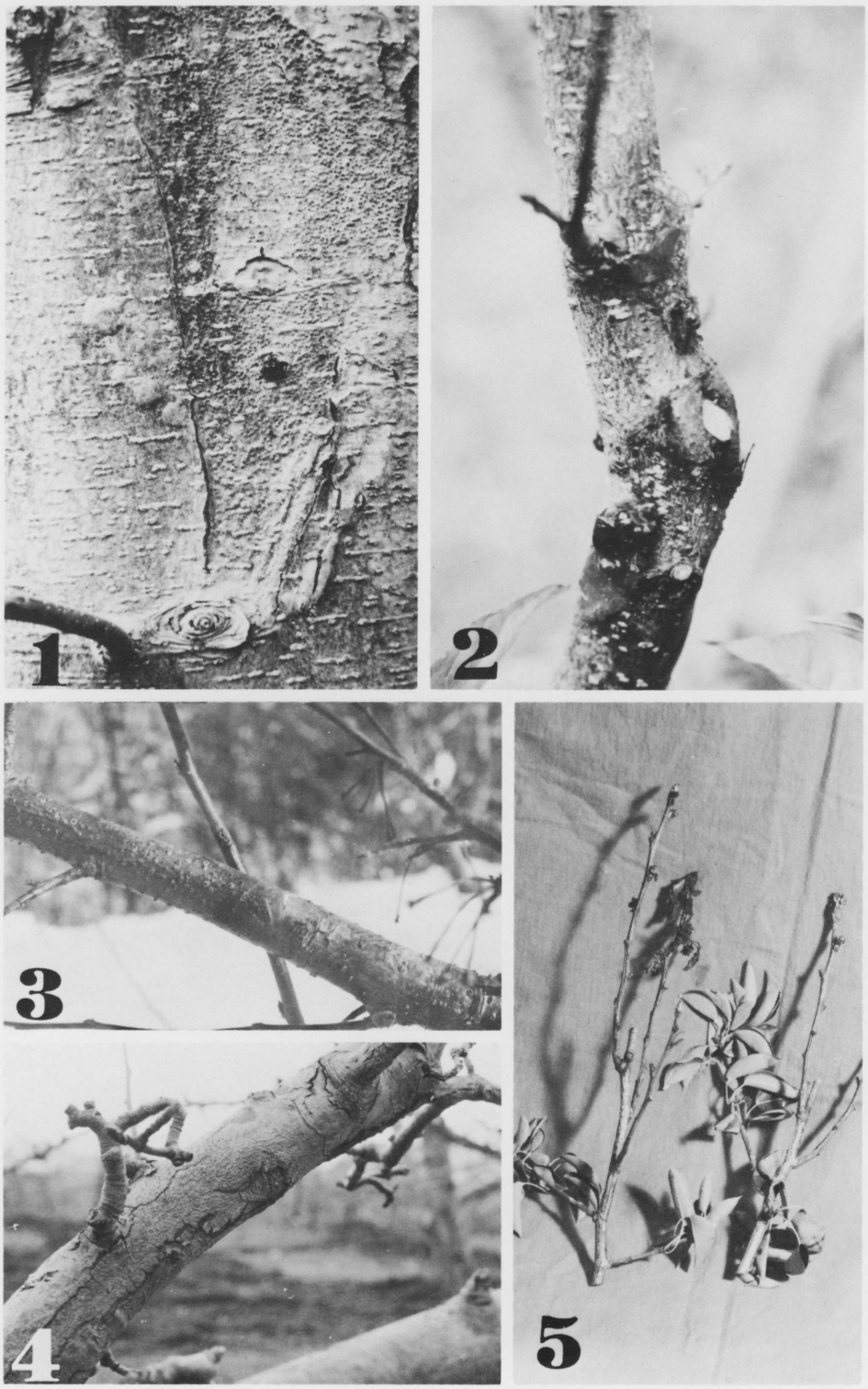

Plate II