Supplemental Movies Legends.

Supplemental Movie S1. Detection of ROS on a wild-type stigmatic papilla cell after pollination with a wild-type pollen grain. Fluorescence images. ROS were visualized using the fluorescent ROS indicator Oxyburst Green (H_2DCFDA). Consecutive images were captured at 1-min intervals for about 20 min.

Supplemental Movie S2. Detection of ROS on a wild-type stigmatic papilla cell after pollination with a wild-type pollen grain. Bright field images. Consecutive images were captured at 1-min intervals for about 20 min.

Supplemental Movie S3. Detection of ROS on a wild-type stigmatic papilla cell after pollination with a wild-type pollen grain. Overlay images. Consecutive images were captured at 1-min intervals for about 20 min.

Supplemental Movie S4. Detection of ROS on the a-type stigmatic papilla cell after pollination with an *rbohH-3 rbohJ-2* double mutant pollen grain. Fluorescence images. ROS were visualized using the fluorescent ROS indicator Oxyburst Green (H_2DCFDA). Consecutive images were captured at 1-min intervals for about 30 min.

Supplemental Movie S5. Detection of ROS on a wild-type stigmatic papilla cell after pollination with an *rbohH-3 rbohJ-2* double mutant grain. Bright field images. Consecutive images were captured at 1-min intervals for about 30 min.

Supplemental Movie S6. Detection of ROS on a wild-type stigmatic papilla cell after pollination with an *rbohH-3 rbohJ-2* double mutant grain. Overlay images. Consecutive images were captured at 1-min intervals for about 30 min.

Supplemental Movies Material and Method.

Flowers of wild-type (Col) *A. thaliana* whose anthers were removed before dehiscence were excised and attached to an agar plate. A drop of 20 μM Oxyburst Green (Life Technologies, Carlsbad, CA, USA) solution containing 0.005% Tween 20 was put on the stigma and air-dried for 1 h. The pistil was mounted on a cover slip and a pollen grain from a freshly-dehisced anther of WT or *rbohH-3 rbohJ-2* was adhered to the stigma using a micromanipulator and the sample was observed with a confocal microscope (LSM710, Zeiss, Jena, Germany) excited at 488 nm using a Plan-Apo 20×/0.8 objective lens. Fluorescence emission of 500–530 nm was captured at 1-min intervals for 20–30 min.