Response to Reviewer 1 Comments

Point 1: The authors cite several Supplementary figures in the manuscript; however, I did not find the Supplementary Information in the submitted file, and no separate files with SI were available.

Response 1: We have now loaded Supplementary Information in the revised version.

Point 2: Some methods lack sufficient detail in their description. For example, CA activity assay does not provide the enzyme concentration used. How were the pH and time used to change the pH measured? Can you add the raw data of enzyme activity measurements to the SI?

Response 2: We have added the essential details. Line 442: "the pH dropped which determined by pH meter (Orion Star™ A211, Thermo Fisher Scientific, America)". Line 444: "10 μL". We also have added the raw data of enzyme activity measurements in Data S1.

Point 3: Can you also add the purified protein SDS-PAGE results? The description of protein purification is rather limited. The reference [66], which is expected to describe protein purification, deals with completely different rice proteins.

Response 3: We have added the SDS-PAGE result of purified protein to Supplementary Information (Figure S5) and described the protein purification in details (Line414–420) as "The lysis buffer (140 mM NaCl, 2.7 mM KCl, 10 mM Na_2HPO_4, 1.8 mM KH_2PO_4, pH 7.3) was added to the pellet. With high-pressure crushing, the bacterial lysate was centrifuged at 4°C, 10,000 g for 30 min. The mixture of the supernatant and the resin (1:50) was gently shaked for 1 h, and added into the empty column tube of affinity chromatography. Wash it with lysis buffer for 6 times, 1 mL each time. Elute the target protein with elution buffer (50 mM Tris-HCl, 10 mM GSH, pH 8.0) for 6 times, 1 mL each time, and the purified protein was obtained". There is a mistake in reference use. We performed protein purification according to the instructions provided by Beyotime company.