The manuscript investigates cadmium (Cd) accumulation mechanisms in japonica rice using physiological, biochemical, and molecular approaches. The study is generally well designed and provides useful region-specific insights into Cd accumulation in northern Chinese japonica cultivars. The integration of hydroponic and soil experiments strengthens the reliability of the results. Overall, the findings confirm that root-to-shoot translocation plays a dominant role in determining grain Cd accumulation, which is consistent with previous studies, while offering additional comparative data for local germplasm.

However, several aspects require clarification and improvement before publication.

First, the novelty of the study should be more carefully positioned. The conclusion that translocation rather than uptake determines Cd accumulation has already been widely reported. Therefore, the manuscript should emphasize its regional contribution and comparative analysis rather than presenting this conclusion as a novel finding. The most interesting contribution appears to be the contrasting expression pattern of OsLCD between low- and high-Cd varieties, but its interpretation should be more cautious.

Second, there is an apparent inconsistency in the behavior of the SN9903 variety. Although it shows relatively high root Cd accumulation and a temporary increase in shoot Cd at Day 6, it ultimately maintains low grain Cd levels. This should be explained more clearly. It likely reflects the dynamic and stage-dependent nature of Cd transport, where early shoot accumulation does not necessarily determine final grain Cd. Possible mechanisms such as restricted long-term translocation or enhanced sequestration should be discussed to improve clarity.

Third, the role of OsLCD is currently overinterpreted. While the opposite expression pattern between low- and high-Cd varieties is interesting, the evidence presented is correlative. Therefore, OsLCD should be described as a potential marker associated with Cd accumulation rather than a confirmed regulator. Functional validation (e.g., knockout or overexpression studies) would be required to support stronger conclusions.

Fourth, some limitations in the experimental design should be acknowledged more explicitly. The study includes only four rice varieties, which limits the general applicability of the conclusions. In addition, the lack of controlled genetic backgrounds makes it difficult to attribute differences to specific genes. The hydroponic Cd concentration (1 mg/L) is relatively high compared to field conditions and may influence plant responses.

Fifth, the gene expression analysis is limited to a single time point (Day 9), whereas physiological measurements were conducted over multiple time points. This reduces the ability to link gene expression changes with dynamic Cd accumulation patterns. Including time-course expression data in future studies would improve mechanistic understanding.

Despite these concerns, the overall results are consistent, and most issues relate to interpretation and presentation rather than fundamental flaws in the study. Therefore, I recommend **minor revision**, focusing on improving clarity, moderating conclusions, and better aligning the findings with existing literature.