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INVESTIGATION OF SPATIOTEMPORAL DISTRIBUTION OF NITROGEN, HORMONE ACCUMULATION, AND EXPRESSION PATTERNS OF RELATED GENES IN THE MAIZE *(ZEA MAYS L.)* EAR UNDER LOW NITROGEN

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Nitrogen (N) is a crucial factor limiting the yield of maize, particularly by affecting the kernel number during the silking stage. Insufficient supply of nitrogen can lead to poor ear development and a decrease in the number of grains per ear. Phytohormones, as information transmission substances, play an essential regulatory role in the process of crop growth and development, especially during grain filling (i.e. the development and enrichment of endosperm). Therefore, studying the control mechanisms of maize cob and kernel development under nitrogen stress has important practical significance for improving maize yield. Field experiments were conducted using maize inbred line B73 to study the nitrogen and hormone accumulation and related gene expression characteristic to the maize cob development under low nitrogen condition. We found that low nitrogen significantly inhibited the growth of maize ears and led to baldness consistent with previous reports. At silking stage, the dry weight and nitrogen concentration of different parts of the maize ear followed the order as lower part> middle part> upper part, whereby reducing N concentration significantly in middle part. Furthermore, low nitrogen significantly reduced the accumulation of dry matter in the lower part of the corn cob; decreased auxin and abscisic acid concentrations in all parts of the corn ear without affecting cytokinins and gibberellin concentrations. Importantly, the expression patterns of hormone synthesis/signal transduction genes in the upper, middle and lower parts of the maize ear showed complex variations in rapidly developing maize ear under low nitrogen stress.

Biography

XiaoTing Liu is a PhD scholar in The Key Laboratory of Plant-Soil Interactions, MOE; Department of Plant Nutrition, China Agricultural University, Beijing, China. During her Masters' degree, she used the promoters specifically expressed in the root surface to overexpress the mutant proteins that are free of phosphorylation to observe whether the nitrogen efficiency of transgenic rice can be improved. Her primary research work during PhD is the spatiotemporal distribution of nitrogen, hormone accumulation, and expression patterns of related genes in the maize *(Zea mays L.)* ear under low nitrogen.

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