**摘要模板：**

**Dynamic regulation of DNA methylation and histone modifications in response to abiotic stresses in plants**

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**Abstract**

DNA methylation and histone modification are evolutionarily conserved epigenetic modifications that are crucial for the expression regulation of abiotic stress-responsive genes in plants. Dynamic changes in gene expression levels can result from changes in DNA methylation and histone modifications. In the last two decades, how epigenetic machinery regulates abiotic stress responses in plants has been extensively studied. Here, based on recent publications, we review how DNA methylation and histone modifications impact gene expression regulation in response to abiotic stresses such as drought, abscisic acid (ABA), high salt, extreme temperature, nutrient deficiency or toxicity, and ultraviolet B (UV-B) exposure. We also review the roles of epigenetic mechanisms in the formation of transgenerational stress memory. We posit that a better understanding of the epigenetic underpinnings of abiotic stress responses in plants may facilitate the design of more stress-resistant or -resilient crops, which is essential for coping with global warming and extreme environments.

**Keywords:** abiotic stress, DNA methylation, histone modification, transcriptional regulation

**植物DNA甲基化和组蛋白修饰在非生物胁迫下的动态调控**

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植物通过快速和协调性调控整个基因组的转录和转录后水平来适应非生物胁迫，DNA甲基化和组蛋白修饰是进化中保守的表观遗传修饰，对植物非生物胁迫应答基因的表达调控至关重要，这些修饰的变化可以引起基因表达水平的动态变化。近二十年来，表观遗传机制如何调节植物的非生物胁迫响应得到了广泛的研究。本文详细阐述了植物基因组响应非生物胁迫应答的动态表观遗传修饰（主要集中在DNA甲基化和组蛋白修饰）相关的最新研究进展，同时回顾表观遗传修饰在跨代胁迫记忆形成中的作用。首先汇总了在不同胁迫条件下，DNA甲基化和组蛋白修饰如何影响基因表达的动态调控机制；进一步对乙酰转移酶、去甲基化酶等不同表观遗传修饰酶（催化酶、识别酶及去除酶）在非生物胁迫条件下的功能进行系统介绍；然后，将表观遗传修饰和转录调控因子协同性调控非生物胁迫应答的机制进行总结；最后，对非生物胁迫响应条件下DNA甲基化和组蛋白修饰综合调控网络中尚未厘清的问题进行了讨论。总之，更好地理解植物非生物胁迫响应的表观遗传学基础，有助于设计抗逆性或适应性更强的作物，应对全球气候变化和日益频发的极端环境。

**关键词：**非生物胁迫，DNA甲基化，组蛋白修饰，转录调控