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## The Ca<sup>2+</sup> sensor proteins CML37 and CML42 antagonistically regulate plant stress responses by altering phytohormone signals

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关键词	<a href="#">Jasmonates</a> ; <a href="#">Abscisic acid</a> ; <a href="#">Drought</a> ; <a href="#">Herbivory</a> ; <a href="#">Necrotrophic pathogens</a> ; <a href="#">Defense</a> ; <a href="#">Calcium</a> ; <a href="#">Glucosinolates</a> ; <a href="#">Spodoptera littoralis</a> ; <a href="#">Alternaria brassicicola</a> ;
摘要	A transient increase in the cytosolic calcium concentration is one of the first reactions that can be measured in plant cells upon abiotic as well as biotic stress treatments. These calcium signals are sensed by calcium binding proteins such as calmodulin-like proteins (CMLs), which transduce the sensed information into appropriate stress responses by interacting with downstream target proteins. In previous studies, CML37 has been shown to positively regulate the plants' defense against both the insect herbivore <i>Spodoptera littoralis</i> and the response to drought stress. In contrast, CML42 is known to negatively regulate those two stress responses. Here, we provide evidence that these two CMLs act antagonistically in the regulation of induced responses directed against drought and herbivory stress as well as in the defense against the necrotrophic pathogen <i>Alternaria brassicicola</i> . Both CMLs shape the plant reactions by altering the phytohormone signaling. Consequently, the phytohormone-regulated production of defensive compounds like glucosinolates is also antagonistically mediated by both CMLs. The finding that CML37 and CML42 have antagonistic roles in diverse stress-related responses suggests that these calcium sensor proteins represent important tools for the plant to balance and fine-tune the signaling and downstream reactions upon environmental stress.
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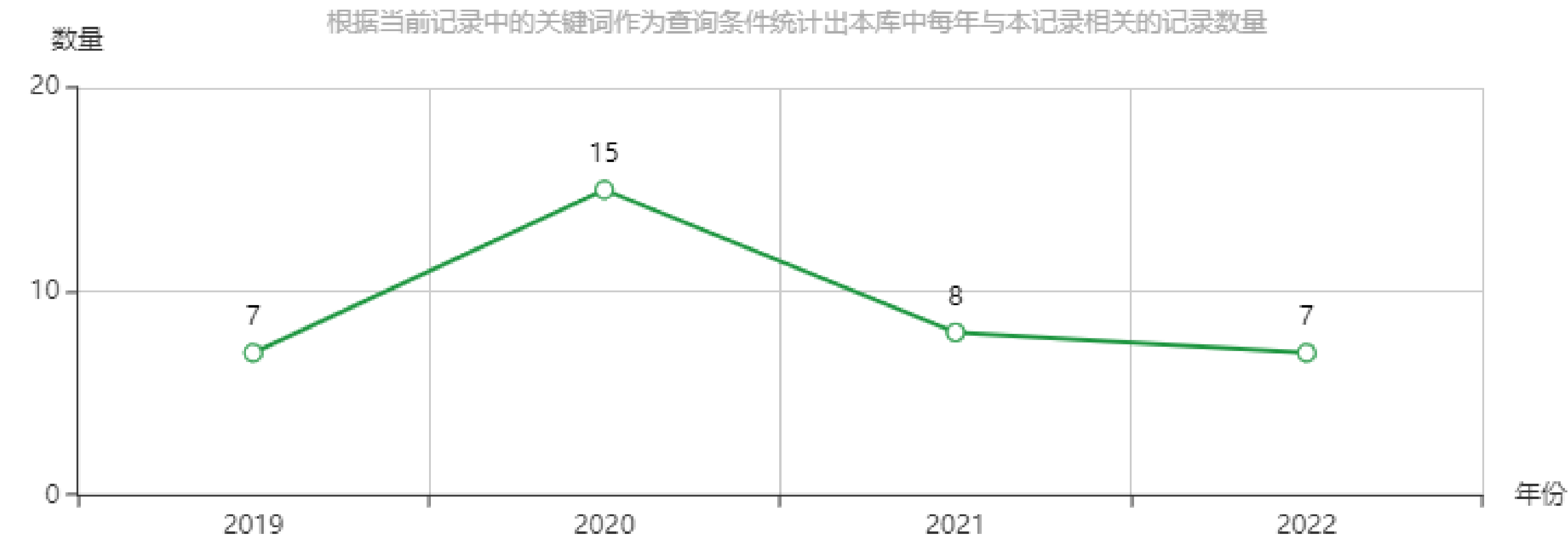
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