

Non-enzymatic action of expansins

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From their simulations of endoglucanase Cel45A, Bharadwaj *et al.* (1) propose that structurally related expansins and MltA may cut glycan backbones without generating reducing ends. This is tenable for MltA, a peptidoglycan lytic transglycosylase whose action produces nonreducing 1,6-anhydro products, but is untenable for expansins.

Expansins loosen plant cell walls and induce wall expansion. Contrary to the assertion by Bharadwaj *et al.*, the conclusion that expansins are not lytic is not merely based on lack of new reducing ends but is supported by multiple (negative) tests for polysaccharide cleavage that do not rely on detection of reducing ends. At least eight studies with three divergent groups of expansins document this point.

- For instance, α -expansin did not reduce the viscosity of various wall polysaccharide solutions, an endolytic assay that does not rely on measuring reducing ends (*e.g.* see Ref. 2 and other studies).
- Walls treated with α -expansin did not release saccharide fragments, measured by pulsed amperometric detection, which can detect nonreducing saccharides (3).
- In the case of β -expansins, protein treatments did not cleave the backbones of a wide range of dye-coupled

cross-linked wall polysaccharides; nor did they cleave backbones of polysaccharides extracted from plant cell walls, measured by gel permeation chromatography (4).

- For five microbial expansins, tests with a range of dye-coupled cross-linked polysaccharides likewise did not detect lytic activity (*e.g.* see Ref. 5).

Thus, extensive published evidence argues against lytic action by expansins, as proposed by Bharadwaj (1), and attempts to identify 1,6-anhydro products seem unlikely to succeed.

References

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