

Total pectin content Assay Kit

Note: Before the experiment, it is recommended to select 2-3 sample with large expected differences for pre-experiment.

Detection instrument: Spectrophotometer

Cat No: BC1400

Size: 50T/24S

Product Composition: Before use, please carefully check whether the volume of the reagent is consistent with the volume in the bottle. If you have any questions, please contact Solarbio staff in time.

Reagent name	Size	Storage
Extract Solution I	Solution 110 mL×1	2-8°C
Extract Solution II	Solution 70 mL×1	2-8°C
Reagent I	Self provided reagents	-
Reagent II	Solution 3 mL×1	2-8°C
Reagent III	Solution 5 mL×1	2-8°C
Standard	Powder×1	2-8°C

Solution preparation:

Reagent I: Self-provided sulfuric acid, approximately 60 mL, and store at room temperature; A 30mL brown empty bottle is provided in the reagent kit for packaging purposes only. Please label the reagent name on your own.

Standard: 10 mg of galacturonic acid. 0.943 mL of Extract solution II is added to prepare a standard solution of 50 $\mu\text{mol/mL}$ before use.

Product Description:

Pectin is one of the main components of plant cell walls, and is divided into water-soluble pectin and insoluble pectin (original pectin or alkali-soluble pectin). Pectin is a natural polymer compound with good gelling and emulsifying stability. It has been widely used in food, medicine, daily chemical and textile industries.

The original pectin is hydrolyzed into soluble pectin in dilute acid. It and the original soluble pectin is further converted into galacturonic acid. The product is condensed with carbazole in a strong acid to form a purple-red compound, which has a characteristic absorption peak at 530 nm.

Technical index:

Minimum detection limit: 0.0237 $\mu\text{mol/mL}$

linear range: 0.0625-1.5 $\mu\text{mol/mL}$

Reagents and Equipment Required but Not Provided.

Spectrophotometer, table centrifuge, water bath, concentrated sulfuric acid (>95%, AR), 1 mL glass cuvette, adjustable pipette, mortar/homogenizer, distilled water.

Procedure:

I. Sample preparation:

Crush the tissue sample and prepare it in a 1:20 ratio of sample weight (g) to Extraction solution I volume (mL) (it is recommended to take about 0.05g of sample and add 1mL of Extraction solution I). Place it in a 90°C constant temperature water bath for extraction for 30 minutes (wrap the sealing film to prevent bursting). After cooling, centrifuge at 5000g and 25°C for 10 minutes to remove the supernatant. Add 1mL of Extraction solution I to the precipitate and repeat the process once. After centrifugation, remove the supernatant. Add 1mL of Extraction solution II to the precipitate and hydrolyze it in a 90°C constant temperature water bath for 1 hour (wrap the sealing film to prevent bursting). Remove and cool it, centrifuge at 8000g and 25 °C for 15 minutes, and take the supernatant for testing.

II. Determination procedure:

- 1 Preheat the spectrophotometer 30 min, adjust wavelength to 530 nm, set zero with distilled water.
- 2 Preparation of standard solution: Dilute 50 μmol/mL standard solution with Extract solution II to 1.5, 1, 0.5, 0.25, 0.125, 0.0625 μmol/mL standard solution for use (Be careful not to directly detect the absorbance value in this step).
- 3 Add reagents with the following list:

Reagent name (μL)	Blank tube (B)	Standard tube(S)	Control tube(C)	Test tube (T)
Sample	-	-	100	100
Standard solution	-	100	-	-
Distilled water	100	-	-	-
Reagent I	800	800	800	800
Mix well, leave it at 90 °C for 10min (wrap the sealing film to prevent bursting), and remove it and cool.				
Reagent II	-	-	100	-
Reagent III	100	100	-	100
Mix well, after standing at 25°C for 30 minutes, and measure the absorbance at 530 nm of each tube and record them as A_B , A_S , A_C , and A_T . $\Delta A_S = A_S - A_B$, $\Delta A_T = A_T - A_C$.				

III. Calculation of Total pectin content:

- 1 Drawing of standard curve:

Taking the concentration of each standard solution as the x-axis and its corresponding ΔA_S as the y-axis, draw a standard curve to get the standard equation $y = kx + b$, and bring ΔA into the equation to get x (μmol/mL).

- 2 Calculation of Total pectin content:.

$$\text{Total pectin content } (\mu\text{mol/g weight}) = x \times V_{\text{EII}} \div W = x \div W$$

V_{EII} : Add the volume of Extract Solution II, 1 mL;

W: Sample weight, g.

Note:

1. Concentrated sulfuric acid has strong corrosiveness, and special attention should be paid during

operation. Heat it at 90 °C, cool it down, and then open the lid to prevent liquid splashing and burns.

2. If the absorbance value exceeds the linear range, the sample size can be increased or diluted before

proceeding with the measurement.

Examples:

1. Take 0.05g of apple pulp for sample processing. Dilute the supernatant 5 times and follow the measurement steps, measure and calculate: $\Delta A = A_T - A_B = 0.34 - 0.05 = 0.29$, standard curve: $y = 0.7498x + 0.017$, calculate $x = 0.364$, according with weight of sample to calculate:

Total pectin content ($\mu\text{mol/g weight}$) = $x \times 5(\text{dilution ratio}) \div W = 36.4 \mu\text{mol/g weight}$.

Recent Product citations:

- [1] Wang Z, Yu S, Nie Y, Liu R, Zhu W, Zhou Z, Ma Y, Diao J. Effect of acetochlor on the symbiotic relationship between microalgae and bacteria. *J Hazard Mater.* 2024 Feb 5;463:132848. doi: 10.1016/j.jhazmat.2023.132848. Epub 2023 Oct 24. PMID: 37924702.
- [2] Tang C, Wang P, Zhu X, Qi K, Xie Z, Zhang H, Li X, Gao H, Gu T, Gu C, Li S, de Graaf BHJ, Zhang S, Wu J. Acetylation of inorganic pyrophosphatase by S-RNase signaling induces pollen tube tip swelling by repressing pectin methylesterase. *Plant Cell.* 2023 Sep 1;35(9):3544-3565. doi: 10.1093/plcell/koad162. PMID: 37306489; PMCID: PMC10473231.
- [3] Qi X, Li K, Chen L, Zhang Y, Zhang N, Gao W, Li Y, Liu X, Fan Z. Plant Defense Responses to a Novel Plant Elicitor Candidate LY5-24-2. *Int J Mol Sci.* 2022 May 11;23(10):5348. doi: 10.3390/ijms23105348. PMID: 35628165; PMCID: PMC9140985.
- [4] Yang M, Wang M, Zhou M, Zhang Y, Yu K, Wang T, Bu T, Tang Z, Zheng T, Chen H. ABA and SA Participate in the Regulation of Terpenoid Metabolic Flux Induced by Low-Temperature within *Conyza blinii*. *Life (Basel).* 2023 Jan 29;13(2):371. doi: 10.3390/life13020371. PMID: 36836728; PMCID: PMC9959218.
- [5] Ge L, Lai H, Huang Y, Wang Y, Li Y, Zhu S, Shi Q, Li H, Zhu Y, Zhao N. Comparative evaluation of package types in alleviating textural softening and package-swelling of Paocai during storage: Insight into microbial invasion, cell wall pectinolysis and alteration in sugar and organic acid profiles. *Food Chem.* 2021 Dec 15;365:130489. doi: 10.1016/j.foodchem.2021.130489. Epub 2021 Jun 28. PMID: 34243120.

Related Products:

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|---------------|-------------------------------|
| BC2630/BC2635 | Pectinase Activity Assay Kit |
| BC3680/BC3685 | Protopectin Content Assay Kit |

BC1400 – Page 3 / 3

BC2660/BC2665 Ploygalacturonase (PG) Activity Assay Kit

