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Soil Saccharase (S-SC) Activity Assay Kit

Note: Take two or three different samples for prediction before test.

Operation Equipment: Spectrophotometer

Catalog Number: AK0574

Size: 50T/24S

Components:

Reagent I: Methylbenzene 5 mL×1. Storage at 4℃ (Requird but not provided).

Reagent II: Liquid 15 mL×1. Storage at 4℃ .

Reagent III: Powder×1, storage at 4℃ . Dissolve with 40 mL of distilled water before use.

Reagent IV: Liquid 35 mL×1. Storage at 4℃ .

Standard: Powder×1. Storage at 4℃ . Containing 10 mg of anhydrous glucose (dry weight loss<0.2%). Dissolve the standard with 1 mL of distilled water to generate a 10 mg/mL glucose solution standard, store at 4℃ and use within one week.

Product Description:

Soil Saccharase (S-SC) can hydrolyze saccharose into corresponding monosaccharides and can be absorbed by the body. The enzymatic product is an important index for evaluating soil fertility, which is closely related to the content of organic matter, nitrogen and phosphorus in soil, the number of microorganisms and soil respiration intensity.

S-SC catalyzes saccharose to form reduced sugar. The reduced sugar can react with 3,5- dinitrosalicylic acid to form a brownish red amino complex which can be detected by colorimetric assay at 540 nm. In this kit, the soil saccharase activity can be determined by measuring the color depth at 540 nm indirectly.

Reagents and Equipments Required but Not Provided:

Spectrophotometer, water bath, desk centrifuge, transferpettor, 1 mL glass cuvette, 30 mesh sieve (or smaller), methylbenzene (express delivery not allowed), ice and distilled water.

Procedure:

I. Sample preparation

Air dry the fresh soil samples naturally or in the oven at 37℃, and pass the 30~50 mesh sieve.

II. Determination procedure

1. Preheat spectrophotometer for 30 minutes, adjust the wavelength to 540 nm, set zero with distilled water.

2. Standard preparation: Dilute the 10 mg/mL glucose solution standard to 0.5, 0.4, 0.3, 0.2, 0.1 mg/mL with distilled water.

3. Add reagents as the following table.

Reagent	Test tube (T)	Contrast tube (C)	Standard tube (S)	Blank tube (B)

Dry soil sample (g)	0.1	0.1	-	-
Reagent I (μL)	15	15	-	-
The soil samples are all wetted by oscillating mixing, and let stand at 37℃ for 15 minutes.				
Reagent II (μL)	250	250	-	-
Reagent III (μL)	750	-	-	-
Distilled water	-	750	-	-
Mix thoroughly. Incubate at 37℃ water bath for 24 hours. Centrifuge at 10000 ×g for 5 minutes at 4℃ and take the supernatant. The supernatant is diluted 10 times and test (add 0.9 mL of distilled water into 0.1 mL of supernatant). Dilute it again if the OD >1.5.				
Supernatant (μL)	200	200	-	-
Standard (μL)	-	-	200	-
Distilled water	-	-	-	200
Reagent IV (μL)	500	500	500	500

Mix thoroughly, put in boiling water for 5 minutes (cover tightly to prevent water loss). Cooling with flowing water, then mix thoroughly.

Sample: Detect the absorbance at 540 nm and note as A_T, A_C. Calculate $\Delta A_T=A_T-A_C$. Each test tube should be provided with one contrast tube.

III. S-SC activity calculation:

Standard curve established: Set the counter to zero with distilled water. Detect the absorbance at 540 nm and note as A_S, A_B. Calculate $\Delta A_S=A_S-A_B$. According to the concentration of the standard tube (y) and absorbance $\Delta A_S=A_S-A_B$ (x), establish standard curve. According to the standard curve, take the ΔA_T (A_T-A_C, x) to the equation to acquire the sample concentration y(mg/mL).

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the production of 1 milligram of reduce sugar in the reaction system per day every gram soil sample.

S-SC (U/g soil sample) = y×10×Vrv÷W÷T = 101.5×y

10: Dilution multiple;

T: Reaction time, 1 day;

Vrv: Total reaction volume, 1.015 mL;

W: Sample weight, 0.1 g.

Recent Product Citations:

[1] Hou Q, Wang W, Yang Y, et al. Rhizosphere microbial diversity and community dynamics during potato cultivation[J]. European Journal of Soil Biology, 2020, 98: 103176.

References:

[1] Gao M, Song W, Zhou Q, et al. Interactive effect of oxytetracycline and lead on soil enzymatic activity and microbial biomass[J]. Environmental toxicology and pharmacology, 2013, 36(2): 667-674.

Related Products:

AK0566/AK0565 Soil Alkaline Phosphatase(S-AKP/ALP) Activity Assay Kit

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AK0594/AK0593	Soil Polyphenoloxidase Activity Assay Kit
AK0116/AK0115	Soil Neutral Invertase(S-NI) Activity Assay Kit
AK0118/AK0117	Soil β- 1,4-Glucanase Activity Assay Kit
AK0122/AK0121	Soil β-Xylosidase(S-β-XYS) Activity Assay Kit