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Short Communication

Cassava starch as an alternative to agar-agar in microbiological media

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Cassava starch powder produced locally was tested for its ability to serve as a solidifying agent in microbiological nutrient media, using different aqueous percentage concentration in pour plates and slants. 10% concentration produced setting usually associated with solid nutrient media within 30 min. Cassava starch powder can therefore be a potential solidifying agent in microbiological nutrient media as an alternative to agar-agar.

Key words: Cassava, agar-agar, media, microbial growth.

INTRODUCTION

There had been report in the literature of the use of cassava, *Manihot esculenta*, in its soluble starch form in composite media with agar for enhancing specific properties. The effective use of agar in solid media is attributable to its non-supporting growth property for microorganism and its relatively higher solidifying temperature (Davis et al., 1973). Essentially like agar, cassava starch is an acidic polysaccharide (Davis *et al* 1973) consisting in its powdered form of 77% carbohydrate, 21% lipid and 2% protein. This study attempts to explore the possibility of using cassava starch as a solidifying agent, and an alternative to agar in solid microbial nutrient media.

MATERIALS AND METHODS

Cassava was obtained from Sokoto town. The starch powder was prepared in the laboratory as follows: 2.5 kg of cassava tubers were peeled, washed in clean water and grated. It was soaked in fresh clean water for 24 h and thereafter filtered through a white meslim cloth into a bowl. Settling out of the supernatant into a solid paste was allowed for 7 h. The powdered starch was produced by heating in a Gallenkamp hot air oven at 120°C for 2 h. Cooking of the starch powder was prevented by spreading the mashed paste thinly on a piece of aluminum foil during the drying process. 2 to 12 g of the starch powder was weighed into clean 250 ml conical flasks and 100 ml of distilled water was added. The pH was also adjusted to either 7.3 or 3.9, and autoclaving at 121°C for 15 min. 25 ml of the sterilized mixtures were poured into petridishes (Twomey and Mackie., 1985).

Subcultures of the microbial isolates were made on the plates by streaking and incubated at 37°C for 72 h for bacteria, 30°C for 5 days for yeasts, and room temperature (27°C) for 5 days for the moulds.

RESULTS AND DISCUSSION

10% cassava starch gave satisfactory setting typical of solid nutrient within 30 min to 1 h in both plates and slants. The method of autoclaving used in sterilizing the aqueous starch mixture was found to enhance its gelling quantity. The gelling property appeared to improve with age both in the hot air oven at 37-40° C and at room temperature up to six months. Both sets of plates at pH 7.3 and 3.9 did not support growth of *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeroginosa*, *Salmonella typhi*, *Aspergillusn niger* and *Aspergillus flavus*.

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This study has revealed the potentiality of cassava starch powder in providing a suitable alternative to agar, as a solidifying agent at 10% concentration. The cassava starch is not available as nutrient for microbial use, a necessary attribute of any potential solidifying agent in nutrient media. Future work will combine the starch powder with sources of nutrients necessary for microbial growth, with a view of formulating basal cassava starch medium and its related forms for selective, enriched and differential studies.

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