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Formulation of microbial growth medium using banana peel and maize cob

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r This experiment was carried out with the aim of formulating growth media using organic waste materials (banana peel L and maize cob) from the environment. Banana peel and maize cob were collected from different locations within Gombe main market from various banana and maize sellers. The collected materials were air dried, grinded into fine particles using mortar and pestle and then sieved with 0.8 mm sieve size. Bacteria isolates (Escherichia coli, Staphylococcus aureus, Shigella sp., Salmonella spp., Klebsiella sp., and Pseudomonas aureginosa) were collected from Federal Teaching Hospital Gombe and confirmed using relevant biochemical tests and the fungi isolates were isolated from spoilt bread and orange using potato dextrose agar (PDA) and the formulated media. Proximate analysis carried out, show that the banana peel contained 18.56% moisture, 3.05% ash, 7.20% fat, 16.54% protein, 15.42% crude fibre and 45.23% carbohydrate, while the corresponding values for maize cob is 10.14% moisture, 2.86% ash, 2.20% fat, 14.18% protein, 13.26% crude fibre and 59.36% carbohydrate. The bacterial isolates were sub-cultured onto commercially prepared nutrient agar medium and the formulated banana peel and maize cob media. The colonial characteristics of both the commercially prepared agar and the formulated media were compared for each isolate. Total bacterial count was carried out and the result showed 2.50×10⁴, 2.12×10⁴ and 1.95×10⁴ on nutrient agar, 1.50×10⁴, 1.10×10^4 and 1.20×10^4 on banana peel agar and 1.85×10^4 , 1.40×10^4 and 1.70×10^4 on maize cob agar for *E. coli, Staphylococcus* aureus and Shigella sp., respectively. Visible growth 0.67×10⁴ of Salmonella was observed on maize cob only, while no visible growth for Klebsiella spp., and Pseudomonas aeureginosa was observed on both the banana peel and maize cob agar. Fungi were also isolated from spoilt bread and orange using commercially prepared potato dextrose and the formulated banana peel and maize cob media. Three fungi were isolated and identified; the cultural characteristics of each fungus on each medium were compared. The fungi isolated and identified with their total plate count were as follows: Aspergillus niger $(3.0 \times 10^4, 5.0 \times 10^4)$ on banana peel and potato dextrose agar respectively with no visible growth observed on maize cob agar), Rhizopus stolonofer (4.0×10⁴, 2.2×10⁴, 4.7×10⁴ on banana peel, maize cob and potato dextrose agar respectively) and Saccharomycse cerivisiae $(2.9 \times 10^4, 1.5 \times 10^4 \text{ and } 3.6 \times 10^4 \text{ on banana peel, maize cob and potato dextrose agar respectively})$. From these results, it can be proposed that banana peel agar could be used as an enrichment medium for the growth of fungi, while maize cob agar could be more useful in bacterial growth medium.

Biography

Wasa Alibe Ahmed is currently a PhD student at the University of Canterbury, Christchurch, New Zealand. He has obtained his BSc in Applied Microbiology and MSc in Medical Microbiology from Abubakar Tafawa Balewa University and Modibbo Adama University of Technology, Nigeria, respectively. He has few papers published in journals and is currently working towards developing immunodiagnostic biosensors.

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