

Abstract

Background:

Microbial resistance has become an increasing global problem and there is a need to find out novel potent anti-microbial agents with alternative modes of action as accessories to antibiotic therapy.

Methods & Materials:

This study investigated the antioxidant, antimicrobial and synergistic properties of tea polyphenols. The tea germplasm from Kenya, China and Japan that are grown in Kenya were characterized for their biochemical profiles. The total phenolic content, theaflavins and thearubigins content of different tea products used in this study were determined spectrophotometrically according to Folin-Ciocalteu and flavogost methods, respectively.

The individual catechin contents were characterized by high performance liquid chromatography (HPLC) and identified according to their HPLC retention times, elution order and comparison with authentic standards. The antioxidant activity of tea polyphenols was determined spectrophotometrically on its ability to scavenge 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical. The agar disc diffusion method was used to screen for antimicrobial and synergistic activities of the tea liquors.

Results:

Black, green, purple coloured leaf and white (silvery tips) tea products characterized for their biochemical profiles differed significantly in the levels of total polyphenols, total catechins, catechins fractions, theaflavins and thearubigins ($p \leq 0.05$). Green, purple coloured leaf (aerated), black tea from terminal buds and white tea products analyzed in this study exhibited slightly higher antioxidant activity as compared to black tea. The different types of tea products assayed in this study exhibited significant influence on the inhibition zone diameters against bacteria and fungi exposed to the tea extracts. Methicillin and penicillinase resistant *S. aureus* ATCC 25923, *C. albicans* ATCC 90028 and a clinical isolate of *C. Neoformans* were most susceptible to all tea extracts than *E. coli* and *S. typhi*. There was synergism between most tea extracts and penicillin G against methicillin and penicillinase resistant *S. Aureus* ATCC 25923.

Conclusion:

This study suggests potential use of tea extracts as an antimicrobial agent.