

Evaluation of antimicrobial activity and phytochemical analysis of sicilian lemon peel (*Citrus lemon* Burm).

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Accepted on November 2, 2017

Editorial

Lemon is a fruit easily found and produced throughout the year [1]. This fruit is widely used in the food, cosmetics and pharmaceutical industries mainly due to the essential oil present in its peel [2,3]. The main components of this fruit are limonene, p-cymene, terpenol and citral, the first being the main constituent of its essential oil [4,5]. In this context and regarding the constant and unrestrained use of chemical preservatives, especially antibiotics, as well as due to the fact that many microorganisms develop resistance in relation to these antibiotics, substances that are naturally present in foods that can act on microorganisms, retarding their development and increasing the useful life of foods where they are present have been studied, as is the case of this work, whose aim was to study the possibility of extracts (alcoholic and aqueous cold and hot) of the Sicilian lemon peel at proportions of 0, 5, 10, 15, 20, 25 and 100% to have antimicrobial activity against bacteria *Escherichia coli* and *Staphylococcus aureus* and yeast *Saccharomyces cerevisiae*. The extracts were carried out using the protocol described by Racowski, et al. [6] and the microbial inhibition assays commonly use the agar diffusion method and the Miller Hinton (MH) culture medium for bacteria and the Potato Dextrose Agar (PDA) culture medium for yeast [7,8]. The composition of these extracts was also checked by rapid tests: tannin test, saponin test, flavonoid test, terpenoid test and carbohydrate test [9]. The diameter of zone of inhibition around each well was measured with the aid of a digital caliper, each inhibition zone being measured in triplicate (in three different ways to reduce error due to irregular growth) and submitted to Kruskal-Wallis analysis of variance and compared by the Mann-Whitney test, both with 5% significance using the Action Stat software (Version 3.1, Estatcamp, Brazil). With the result, it was possible to verify that the extracts of the Sicilian lemon peel presented tannins, flavonoids and terpenoids in their composition and inhibitory activity against the growth of microorganisms in a differentiated way. Regarding the bacteria under study, all extracts showed inhibition halos, and the best *E. coli* inhibitor was the alcoholic extract (100%-21.1 mm). In addition, it is worth mentioning that in the case of alcoholic extracts and cold aqueous extract at concentration of 10%, there was growth inhibition of this bacterium in Petri dishes, forming halos in the order of 15.0 mm. In the hot aqueous extract, this occurred only from the concentration of 15%. The same was verified for *S. aureus*, however, with the formation of smaller halos (10%-1.2 mm) when compared to *E. coli*. In the case of hot aqueous extract, the inhibition halo was 4.6 mm for the first concentration that showed inhibition (15%). *S. cerevisiae* was the most difficult to inhibit since the cold aqueous extract showed no inhibition at any of the concentrations, whereas the hot aqueous extract showed

inhibition only when used at concentration of 100%, but the inhibition halo was small (7.7 mm). The alcoholic extract showed inhibition of yeast growth at concentration of 15% (15%-10.3 mm, 20%-11.4 mm, 25%-11.4 mm and 100%-12.0 mm). Thus, the results obtained showed that the alcoholic and aqueous extracts of the Sicilian lemon peel can serve as an alternative to inhibit the growth of bacteria *E. coli* and *S. aureus* and yeast *S. cerevisiae*.

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Citation: *Racowski I, Piotto J, Procópio V. Evaluation of antimicrobial activity and phytochemical analysis of sicilian lemon peel (Citrus lemon Burm). Microbiol Curr Res 2017;1(1):3-4.*

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