Latin American Journal of Pharmacy
(formerly *Acta Farmacéutica Bonaerense*)
Lat. Am. J. Pharm. **42** (7): 1499-1505 (2023)

Received: April 2, 2023
Accepted: April 25, 2023

Antimicrobial Activity of *Citrus limon* Juice Extracts against *Streptococcus pyogenes* Isolated from Sore Throat Patients in Jeddah City-Saudi Arabia

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SUMMARY. **Lemon fruit is an herbal remedy that has many therapeutic uses. This cross-sectional study aimed to determine the antimicrobial activity of *Citrus limon* (CL) extract against *Streptococcus pyogenes* solated from patients had sore throats infection in Jeddah, Saudi Arabia. A total of 135 throat swabs were collected from sore throat patients. Standard culture techniques, Bacitracin sensitivity test, Rapid antigen detection and Lancefield antigen determination were used to identify *S. pyogenes*. Using a cup plate method, the antimicrobial activity of different concentrations of aqueous extracts of CL were tested against 72 *S. pyogenes* isolates. Minimum inhibition concentration was performed. Out of 135 sore throat swabs, 72 (53.3%) showed *S. pyogenes* growth, whereas 63 (46.7%) were negative. The majority of *S. pyogenes* was detected in 68/72 (88.6%) of the patients in the age group < 15 years and 40/72 (55.6%) of females, with no association of growth with age or gender ($p = 0.67, 0.85$, respectively). Antimicrobial activity of CL extract showed the highest inhibition zone at a concentration of 100% with a mean of (21.5 ± 1.35 mm), 50% was (17.8 ± 1.59 mm), 25% was (14.2 ± 2.86 mm), while 12.5% showed no inhibition zone. The MIC of *Citrus limon* juice extract was 25%. *S. pyogenes* was the most prevalent bacterial etiology of sore throat. *Citrus limon* juice was extracted effectively against *S. pyogenes* when its concentration was increased, demonstrating a concentration-dependent effect.**

RESUMEN. La fruta del limón es un remedio a base de hierbas que tiene muchos usos terapéuticos. Este estudio transversal tuvo como objetivo determinar la actividad antimicrobiana del extracto de *Citrus limon* (CL) contra *Streptococcus pyogenes* aislado de pacientes con dolor de garganta en Jeddah, Arabia Saudita. Se recogieron un total de 135 frotis de garganta de pacientes con dolor de garganta. Se utilizaron técnicas de cultivo estándar, prueba de sensibilidad a la bacitracina, detección rápida de antígenos y determinación de antígenos de Lancefield para identificar *S. pyogenes*. Usando un método de taza y plato, se probó la actividad antimicrobiana de diferentes concentraciones de extractos acuosos de CL contra 72 aislados de *S. pyogenes*. Se realizó la concentración mínima de inhibición. De 135 frotis de dolor de garganta, 72 (53,3 %) mostraron crecimiento de *S. pyogenes*, mientras que 63 (46,7 %) fueron negativos. La mayoría de S. pyogenes se detectó en 68/72 (88,6%) de los pacientes del grupo de edad < 15 años y 40/72 (55,6%) del sexo femenino, sin asociación del crecimiento con la edad o el género ($p = 0,67$, 0,85, respectivamente). La actividad antimicrobiana del extracto de CL mostró la mayor zona de inhibición a una concentración del 100 % con una media de (21,5 ± 1,35 mm), el 50 % (17,8 ± 1,59 mm), el 25 % (14,2 ± 2,86 mm), mientras que el 12,5 % no mostró zona de inhibición. La MIC del extracto de jugo de *Citrus limon* fue del 25%. *S. pyogenes* fue la etiología bacteriana más prevalente del dolor de garganta. El jugo de *Citrus limon* se extrajo de manera efectiva contra *S. pyogenes* cuando se aumentó su concentración, demostrando un efecto dependiente de la dosis.

KEY WORDS: antimicrobial activity, *Citrus limon* juice extract, sore throat, *Streptococcus pyogenes*.

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ISSN 0326 2383 (printed ed.)
ISSN 2362-3853 (on line ed.)