

Chemical Composition, Antimicrobial and Anti-inflammatory Activities of Essential Oil from *Cymbopogon proximus*: *In vitro*, and *in vivo* Studies

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SUMMARY. This study was conducted to evaluate the *in vitro* antimicrobial, and *in vivo* anti-inflammatory properties of *Cymbopogon proximus* essential oil (CEO). CEO was evaluated for antimicrobial activity against selected strains of bacteria and fungus by disc diffusion method. CEO was also investigated *in vivo* for anti-inflammatory activity using carrageenan-induced paw edema in albino rats. The antimicrobial test results revealed that the CEO strongly inhibited the growth of the tested bacteria, Gram-positive bacteria were more susceptible than Gram-negative. CEO also showed good anti-inflammatory activity in rats. GC-MS analysis of the tested CEO was investigated to detect phytochemical components in oil fraction with potent biological activities. Overall, 23 chemical compounds, representing 94.12 % of oil, were detected by GC-MS analysis with piperitone (45.11%) as a principal component. The tested CEO can be explored as a good source for oxygenated monoterpenes with valuable antimicrobial and anti-inflammatory properties having a promising pharmaceutical application with appreciable effect on the arachidonic metabolism or modulating cytokines production.

RESUMEN. Este estudio se realizó para evaluar las propiedades antimicrobianas *in vitro* y antiinflamatorias *in vivo* del aceite esencial de *Cymbopogon proximus* (CEO). Se evaluó la actividad antimicrobiana de CEO contra cepas seleccionadas de bacterias y hongos mediante el método de difusión en disco. CEO también se investigó *in vivo* por su actividad antiinflamatoria usando edema de la pata inducido por carragenina en ratas albinas. Los resultados de la prueba antimicrobiana revelaron que el CEO inhibía fuertemente el crecimiento de las bacterias probadas, las bacterias Gram-positivas eran más susceptibles que las Gram-negativas. CEO también mostró una buena actividad antiinflamatoria en ratas. Se investigó el análisis GC-MS del CEO probado para detectar componentes fitoquímicos en la fracción de aceite con potentes actividades biológicas. En general, se detectaron 23 compuestos químicos, que representan el 94,12 % del aceite, mediante análisis GC-MS con piperitona (45,11 %) como componente principal. El CEO probado puede explorarse como una buena fuente de monoterpenos oxigenados con valiosas propiedades antimicrobianas y antiinflamatorias que tienen una aplicación farmacéutica prometedora con un efecto apreciable en el metabolismo araquidónico o modulando la producción de citoquinas.

KEY WORDS: anti-inflammatory, antimicrobial, chemical composition, *Cymbopogon proximus* essential oil.

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