

Antioxidant, Antilipidemic and Antimicrobial Properties of Isolated Phytochemicals in Natural Honey from Nilgiris Biosphere, India

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SUMMARY: The current study sought to isolate phytochemicals in honey from the Nilgiris biome, India, and assess their antioxidant and anti-bacterial activities against six different pathogens. Phytochemicals in honey were extracted and tested using methanol and water extract. Currently, natural products available from plants are being exploited for therapeutics, since they can also serve as nutraceuticals. In this study, phytochemicals were isolated, namely, phenolics, carotenoids, and tannins from the honey mixture. Out of all the samples, the higher concentration of tannins, carotenoids, and phenolics was seen in the aqueous extract. The antioxidant data from nitric oxide, DPPH, and superoxide assays was found to have significant antioxidant activity in phenolic and tannin methanol extract when compared to carotenoid extracts. The phytochemical samples were also treated against six different bacterial strains. All of the phytochemical samples were found to have active antibacterial activity except against *Bacillus cereus* and *E.coli*. In addition, all the isolated phytochemicals were subjected to LDL oxidation inhibition activity. The observation here was again found to have a higher inhibition percentage in tannin methanol extract in honey. Hence, it was found to have good antioxidant capacity. As a result, tannin methanol extract was subjected to HPLC which matched to that of the standard tannic acid which confirmed the presence of tannin compound that could be responsible for antioxidant and antibacterial properties. Therefore, it is evident from the preceding findings that it can be used to inhibit oxidation, halt the growth of atherosclerosis, and aid in the management of cardiovascular disorders.

RESUMEN: El estudio actual buscó aislar fitoquímicos en la miel del bioma Nilgiris, India, y evaluar sus actividades antioxidantes y antibacterianas contra seis patógenos diferentes. Los fitoquímicos en la miel se extrajeron y probaron usando metanol y extracto de agua. Actualmente, los productos naturales disponibles a partir de las plantas están siendo explotados con fines terapéuticos, ya que también pueden servir como nutraceuticos. En este estudio, se aislaron fitoquímicos, a saber, fenoles, carotenoides y taninos de la mezcla de miel. De todas las muestras, la mayor concentración de taninos, carotenoides y fenoles se observó en el extracto acuoso. Se encontró que los datos antioxidantes de los ensayos de óxido nítrico, DPPH y superóxido tienen una actividad antioxidante significativa en el extracto de metanol fenólico y de tanino en comparación con los extractos de carotenoides. Las muestras fitoquímicas también se trataron contra seis cepas bacterianas diferentes. Se encontró que todas las muestras fitoquímicas

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tenían actividad antibacteriana activa excepto contra *Bacillus cereus* y *E.coli*. Además, todos los fitoquímicos aislados se sometieron a la actividad de inhibición de la oxidación de LDL. Se encontró nuevamente que la observación aquí tiene un mayor porcentaje de inhibición en el extracto de metanol de tanino en la miel. Por lo tanto, se encontró que tenía una buena capacidad antioxidante. Como resultado, el extracto de metanol de tanino se sometió a HPLC que coincidía con el del ácido tánico estándar, lo que confirmó la presencia del compuesto de tanino que podría ser responsable de las propiedades antioxidantes y antibacterianas. Por lo tanto, es evidente a partir de los hallazgos anteriores que puede usarse para inhibir la oxidación, detener el crecimiento de la aterosclerosis y ayudar en el tratamiento de los trastornos cardiovasculares.
