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# **Inhibitory effects of black pepper (*Piper nigrum*) extracts and compounds on human tumor cell proliferation, cyclooxygenase enzymes, lipid peroxidation and nuclear transcription factor-kappa-B.**

[Liu Y](#), [Yadev VR](#), [Aggarwal BB](#), [Nair MG](#).

Bioactive Natural Products and Phytochemicals, Department of Horticulture and National Food Safety and Toxicology Center, Michigan State University, East Lansing, Michigan 48824, USA.

## **Abstract**

Black pepper (*Piper nigrum*) and hot pepper (*Capsicum* spp.) are widely used in traditional medicines. Although hot *Capsicum* spp. extracts and its active principles, capsaicinoids, have been linked with anticancer and anti-inflammatory activities, whether black pepper and its active principle exhibit similar activities is not known. In this study, we have evaluated the antioxidant, anti-inflammatory and anticancer activities of extracts and compounds from black pepper by using proinflammatory transcription factor NF-kappaB, COX-1 and -2 enzymes, human tumor cell proliferation and lipid peroxidation (LPO). The capsaicinoids, the alkylamides, isolated from the hot pepper Scotch Bonnet were also used to compare the bioactivities of alkylamides and piperine from black pepper. All compounds derived from black pepper suppressed TNF-induced NF-kappaB activation, but alkyl amides, compound 4 from black pepper and 5 from hot pepper, were most effective. The human cancer cell proliferation inhibitory activities of piperine and alkyl amides in *Capsicum* and black pepper were dose dependant. The inhibitory concentrations 50% (IC<sub>50</sub>) of the alkylamides were in the range 13-200 microg/mL. The extracts of black pepper at 200 microg/mL and its compounds at 25 microg/mL inhibited LPO by 45-85%, COX enzymes by 31-80% and cancer cells proliferation by 3.5-86.8%. Overall, these results suggest that black pepper and its constituents like hot pepper, exhibit anti-inflammatory, antioxidant and anticancer activities.

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