

Nutritional Effects of the Non-nutrients, Capsaicin and Its Analogs, Supplemented to Diets

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Abstract

Capsaicin is a pungent principle of hot red pepper and a non-nutrient. Hot red peppers are now one of the most heavily and widely consumed spices in the world because of their pungency and color. Despite the extensive use as a pungent principle in food, information on nutritional effects of capsaicin is obscure. In this presentation, our studies during a quarter of a century, on the nutritional effects of capsaicin and its analogs supplemented to diets will be illustrated and reviewed in the six subjects as follows: (1) gastrointestinal absorption and metabolism of capsaicin and dihydrocapsaicin in rats, (2) capsaicin supplementation enhances lipid catabolism through catecholamine secretion from adrenal medulla in rats, (3) capsaicin administration enhances thermogenesis, (4) occurrence of capsaicin-hydrolyzing enzyme in liver and the induction by continuous oral administration of capsaicin, (5) relationship among the chemical structure of capsaicin analogs, pungency and adrenal catecholamine secretion, (6) naturally occurrence of novel nonpungent capsaicin analogs, capsiate and its analogs, in a nonpungent cultivar, from a hot red pepper (*Capsicum annuum* L.), and its food functionality.

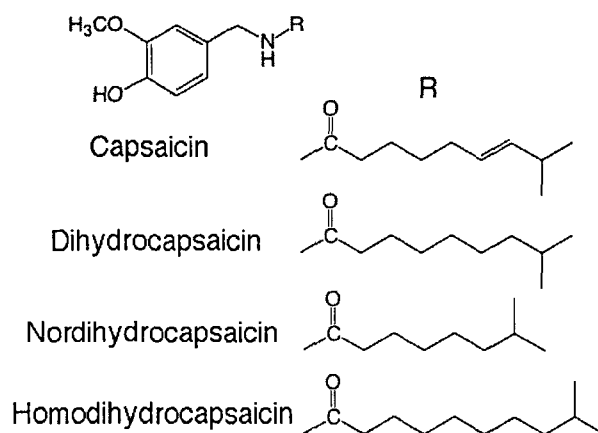


Fig. 1 Chemical structure of capsaicin and major capsaicinoid.

These results support that non-nutrients such as capsaicin and capsiate are well absorbed and play important roles in regulatory energy and lipid metabolisms.

Capsaicin is a major pungent principle of hot red pepper. Hot peppers are now one of the most heavily and widely consumed spices in the world because of their pungency and color.

The chemical structure of capsaicin is an acid-amide of vanillylamine and branched chain fatty acid and comprises compound group capsaicinoid (Fig. 1). In red pepper fruits, the hot principle was found to be composed of at least 14 analogs (1). Capsaicin was recognized to be the major component constituting approximately 70% of total pungent acid-amide, while dihydrocapsaicin amounts to 30% or less. Other components were found only in trace amounts.

The pharmacological functions of capsaicin have been studied intensively. In spite of its extensive use in foods, information on the nutritional effects is obscure.

This review shows our works during a quarter of a century, on the nutritional effects of capsaicin and its analogs supplemented to diets in the following six subjects