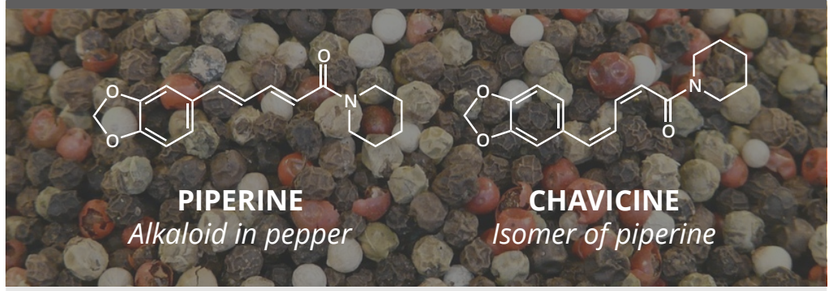
EVERYDAY CHEMICALS: PIPERINE

Piperine is an alkaloid most commonly known for its presence in black pepper. However, it has some other surprising uses. Here, we document a selection.

IN BLACK PEPPER

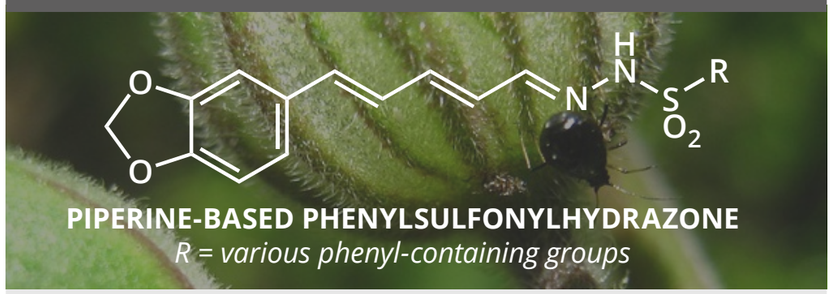


PIPERINE
Alkaloid in pepper

CHAVICINE
Isomer of piperine

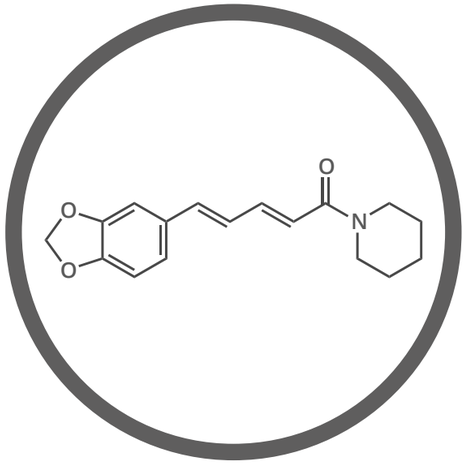
Piperine is 3-9% of black pepper. Black pepper's 'hot' taste is due to piperine; it acts like capsaicin, the compound in chilli peppers that causes their spiciness, though it is only 1% as hot. It triggers tongue nerves which cause the sensation of heat. Piperine can irritate nerve endings in the nose, causing sneezing.

AS AN INSECTICIDE



PIPERINE-BASED PHENYLSULFONYLHYDRAZONE
R = various phenyl-containing groups

Piperine can be used as a repellent against animals, and combined with other compounds can be used in insecticides against flies, lice and various other pests. Derivative compounds, such as piperine-based phenylsulfonylhydrazones, can also show potent delayed insecticidal activity.



PIPERINE

Yellow powder

$C_{17}H_{19}NO_3$

MEDICAL EFFECTS

ANTIEPILEPSINE
Also known as ilepcimide

Black pepper was traditionally used as a remedy for constipation and diarrhoea due to its piperine content. It increases bioavailability of some medications, and also has some analgesic, anti-inflammatory, anti-mutagenic and anti-tumour properties. A piperine analogue, antiepilepserine, can be used in epilepsy treatment.

IN FOODS & DRINKS

ACROLEIN
Formed during distillation of some spirits

Piperine is added to brandy in small amounts as a flavouring additive, in order to impart a pungent taste. Some of the peppery flavour, however, comes from small amounts of acrolein which can form during distillation. Piperine is also found in trace amounts in several foods, including cheese, sugar, and several meats.