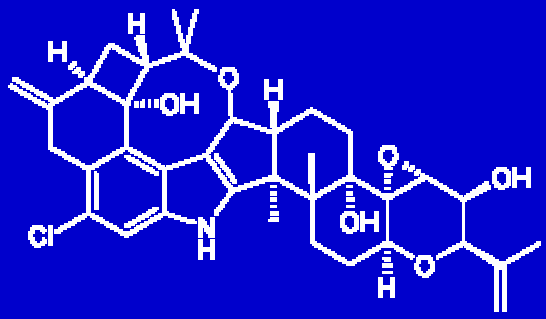
# Tremorgens




TRILOGY
Analytical Laboratory

**Tremorgens**—Any one of a large group of mycotoxins capable of producing tremors in naturally intoxicated or experimentally dosed animals. They include: paspalitrems, paxilline, aflatrems, lolitrems, paspalinine, penitrems, verruculogen, fumitremorgens, territrems, and janthitrems. Most notable are the penitrems (particularly penitrem A), paspalinine, and paspalitrems which have been involved in or closely implicated in natural intoxications. While others have been found in feed causing disease, a cause and effect relationship has not been fully established.

**Producing organisms**—Most of the fungi producing these compounds are of the genus *Penicillium* with *P. crustosum* being most notable for its production of penitrems. Some *Aspergillus* spp. Are producers of aflatrem, verruculogen and fumitremorgens and at least one *Claviceps* sp. (C. paspali) appears to produce tremorgens (paspalinine and palpalitrems).

**Conditions favoring disease and toxin formation in the field**—In the of *Claviceps* sp. In certain grasses such as dallis grass, the fungus replaces the ovary in developing flowers and sclerotia (masses of fungal tissue) replace the seed or grains at maturity. Vectors such as insects and animals are likely more important in disseminating the fungus than are weather conditions. The lolitrems are considered to be produced by an endophytic fungus in ryegrass in select areas of the world (New Zealand, especially). The penitrems have been involved in the saprophytic contamination of material such as cream cheese, bread, beer, and walnuts. Again, the fumitremorgens, aflatrems, and verruculogen are likely the result of the producing fungi growing on any number of dead plant materials or other products. The contact of plant material with soil could be important in the occurrence of some of these mycotoxins in commodities.

**Visible presence of the fungi on commodities or products**—In most cases of tremorgenic episodes there is evidence of mold growth on the commodity or product or there is presence of the brownish to blackish sclerotia of the fungus among the grass grains. However, ryegrass contaminated with lolitrems have no symptoms of contamination with the organism but signs of the organism can be evident microscopically in the ryegrass.

**Storage occurrence of tremorgens**—Other than *Claviceps* contamination of grasses and the occurrence of lolitrems in ryegrass, most of the tremorgans would appear to important in storage of commodities or products. In some cases, as mentioned above, the contamination may be the result of the crop contacting the soil allowing for the fungus to contaminate the gain and cause for tremorgen production. The phenomenon occurs primarily in mature crops. Inadequate storage of materials usually is the cause for contamination. In the case of walnuts, dogs consuming walnuts usually occurs after the walnuts have overwintered on the ground and became contaminated with *Penicillium crustosum*.

**Toxicity impact**—The tremorgens appear to be neurotoxic and cause only chemical lesions in the central nervous system. Dogs appear to seek out materials contaminated with P. crustosum and become ataxic and develop full body tremors with intermittent extensor rigidity. Anesthesia during the episode allows for relaxation of the affected animal and no apparent residual effects exist. Animals that are affected aren't able to eat or drink and dehydration is likely without adequate therapy. Diseases known or likely caused by tremorgens are: ryegrass staggers, bermudagrass tremors, corn staggers, penitrem toxicosis of dogs and humans, paspalum staggers, and some miscellaneous tremorgenic intoxications. Tremorgenic intoxications occur worldwide.

**No regulations exist for these mycotoxins.**

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