

Matrine

Information on the substance

The substance Matrine is neither included in the EU-database pesticides as an active substance nor any application for approval is known. In addition an application to list the substance as a plant strengthener in Germany does not exist.

Sophora is a genus of about 45 species of small trees and shrubs in the pea family *Fabaceae*. The species are native to southeast Europe, southern Asia, Australasia, various Pacific islands, western South America, the western United States, Florida and Puerto Rico.

Matrine is an alkaloid extracted from *Sophora flavescens*, a species of plant in the genus *Sophora* a genus of the *Fabaceae* family being widely distributed in Asia, Oceania, and the Pacific islands. It is not quite clear if matrine can only be found in *Sophora flavescens* or also in addition in other *Sophora* species.

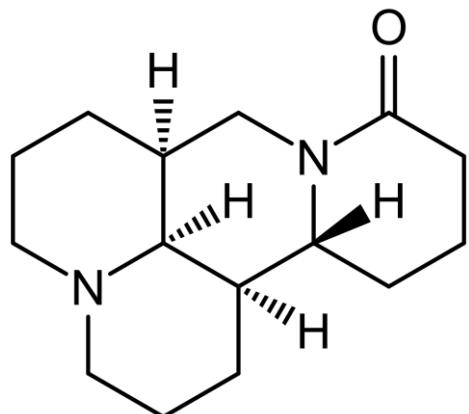
Matrine seems to be the main compound. Nevertheless, related alkaloids occur in higher amounts in *Sophora flavescens*. An overview of compounds detected can be found at

<https://examine.com/supplements/sophora-flavescens/>.

Here further information on toxicology/pharmacology can be found.

As stated in Wikipedia the roots are used in traditional Chinese medicine.

Structure of matrine (from Wikipedia)



Described effects

In some cases it is not quite clear, whether matrine or an extract of alkaloids is investigated or responsible for the described effects.

Further investigations in the internet on matrine results in a couple of papers in Science Direct mostly covering pharmacological effects concerning *Sophora flavescens*.

A description concerning use in traditional Chinese medicine in German can be found at <http://www.china-park.de/Arzneien/sophorae-flavescens-radix/>.

JL-Extract describes on the internet at <https://www.jlextract.com/matrine-lighiyellow-sophora-root-extract-sophora-flavescens-radix-extract.html> the following pharmacological effects:

- 1) "Matrine has obvious inhibition on heart, which can slow the heart rate, weaken the myocardial contractility, and reduce cardiac output;
- 2) This herb itself, matrine, and kurarinone have anti-arrhythmia effects;
- 3) Matrine's injection has rapid and long-lasting effect on aconitine-induced arrhythmias. And it also has antihypertensive effect;
- 4) Its decoction has inhibition on Mycobacterium tuberculosis, Shigella, Staphylococcus aureus, Escherichia coli, and a variety of skin fungus;
- 5) Its decoction can induce diuresis, reduce inflammation, prevent allergies, make people calm down, relieve asthma, eliminate phlegm, elevate white blood cell count, and fight cancer."

In addition the following pesticide functions are described:

"The matrine means total matrines (all alkaloids) extracted from *Sophora Flavescens Ait.* Matrine is a high efficiency, broad spectrum, less resistance low toxic, low residue, environmentally friendly Botanical pesticide, by direct contact, subsidiary by stomach poison. Once pests touch it, their nervous system is paralyzed immediately, then protein of their bodies will denaturalize, finally they will die of breathlessness. Mainly control all kinds of *Dendrolimus punctatus* Walker, *Euproctis Pseudoconspersa* Strand, *Pieris rapae* etc insects. Matrine has good functions of pesticide, Sterilization and regulating plant growth etc. Matrine has been widely used on vegetables, fruits, tea, tobacco and so on, Matrine has high efficacy against aphid, cabbage worm, army worm, red spider, mite etc. In addition, we should also pay attention to the efficacy of matrine on vegetable downy mildew, anthracnose etc."

It means it may act as an insecticide, an acaricide, a fungicide and a plant growth regulator.

In case of fish alkaloid extract from roots of *Sophora flavescens* the mucous membrane of the skin is stimulated and leads to more protection (<https://www.bassleer.com/biofish-food-matrine/>)

Distribution

Sophora flavescens root powder and extracts can be sold on the internet from various distributors like JL-Extract as mentioned above. Xi'an Natural Field Bio-Technology Co.,Ltd is a similar distributor (<https://www.nfnutra.com/agricultural-raw-materials/sophora-flavescens-root-extract-matrine.html>). Made-in-China.com™ mentions prices for different uses and different amounts (<https://www.made-in-china.com/productdirectory.do?word=matrine&subaction=hunt&style=b&mode=and&code=0&comProvince=nolimit&order=0&isOpenCorrection=1>).

Authorisations

It is not known exactly, which countries have authorised matrine in plant protection. The GAIN Report CH17016, dated 31st March 2017 mentions matrine as a pesticide with an ADI of 0.1 mg/kg bw. The residue definition for enforcement is given as matrine with temporary MRLs at a level of 5 mg/kg for head cabbage, cucumber and pear.

(GAIN Report (Global Agricultural Information Network) is a publication of USDA Foreign Agricultural Service. The mentioned report is a translation of National Standard of the People's Republic of China, Issued by National Health and Family Planning Commission, Ministry of Agriculture and China Food and Drug Administration, Issued on: 2016-12-18 Implementation:2017-06-18.)

The German Plant Protection Service mentions that in Spain fertilizers and auxiliary materials are available containing matrine.

Matrine was also discussed on the TAIEX Workshop on Inspection Procedure: Fake Plant Protection Products - Inspection and Controls (Event Number AGR 64363), Podgorica - Montenegro - 27 - 28 September 2018. It was mentioned by Renzo Moro in his lecture "Practical examples of fake PPPs".