

NEWSLETTER OBSERVATORY OF HIGH-STAKE SPECIES FOR HUMAN HEALTH



OBSERVATOIRE DES ESPECES
A ENJEUX
POUR LA SANTE HUMAINE

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OAK AND PINE PROCESSIONARY MOTHS NEW FRENCH REGULATION

Regulation

The **25th April of 2022**, the oak and pine processionary moths entered the health code of the French regulation. Just like *Ambrosia* species, this addition allows territory managers to take action for the control of those species propagation.¹

Carrying urticating hairs, the processionary caterpillars can cause health problems in humans and other warm-blooded animals. Their population are increasingly important in France, and their distribution areas are expanding every year because of climate change. The health risk therefore has been increasing every year.

To address this problem, the French Ministry for Health has decided to classify the oak processionary and the pine processionary moth in the national public health code.

On a local level, this new regulation will allow territory managers in order to raise awareness and prevent the spread of these species.

Is there a similar regulation in your country ?

Please, contact us to share your experience of processionary management.



Oak processionary caterpillar



Pine processionary caterpillar



The observatory of high-stake species for human health is doing an international watch !

With its brand new web page (www.especes-risque-sante.info) the observatory publish informations on species that may pose a risk to human health around the world. These species may or may not already be present in France. If you have information about a species we might be interested in, please send us an email and we will write an article about it.

Below is an example of what our international watch can lead to.

OSTREOPSIS, LOOK OUT FOR THIS SUMMER MICRO-ALGAE

International

Ostreopsis is a tropical micro-algae that can cause significant human intoxication. First observed in France in 1972, it is nowadays regularly detected on Mediterranean and French south-west coasts during the summer.²

Under the right conditions, **Ostreopsis grow and release a toxin that can cause damage on marine biodiversity and human health.** This species can contaminate swimmers, water sports enthusiasts and all other coastal users.

The toxin produced by the micro-algae is **palytoxin***, which can cause a **flu-like condition** for humans. Symptoms after cutaneous contact, inhalation or ingestion are metallic taste, skin reactions, ENT infections, conjunctivitis, dizziness, nausea and fatigue. Clinic signs can appear over the next 48 hours after exposition, but they generally appear 2 to 6 hours after exposition. They usually disappear within 24 to 48 hours of their appearance. The reaction can be more severe in tropical areas, where the algae is more present.

Another effect of this proliferation of microalgae is that some seafood products (fish, mollusc, shellfish, urchin, etc.) can concentrate the toxin inside them and pose a risk for consumers. **As a precaution, it is recommended to not consume recreational fishing products in these areas.**

Additional info : In the Mediterranean sea, the most represented species is Ostreopsis cf. ovata, whereas on the Basque coast it is Ostreopsis cf. siamensis.

*Functioning of palytoxin :



This is the same toxin that is produced by the sunray zoanthid (*Palythoa heliodiscus*), a coral species. The toxin binds to the sodium-potassium pumps in the cells and changes their functioning. This can lead to the **destruction of red blood cells and violent contractions of cardiac and muscle cells.**

AMBROSIA AND BACILLUS, A WINNING DUO

Bacillus soil communities, in particular *B. megaterium*, allow *Ambrosia artemisiifolia* to grow better and improve its competitiveness.³

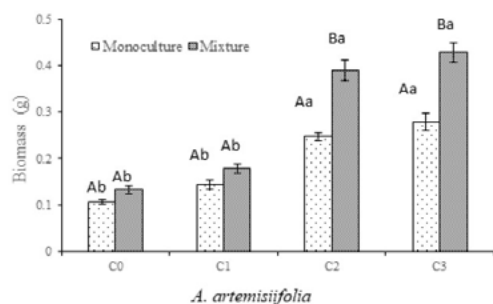


Fig 1. *Bacillus megaterium* concentration effects on *A. artemisiifolia* biomass.

- C0, control ;
- C1: 5×10⁸cfu/mL of *B. megaterium* ;
- C2: 15 10⁸cfu/mL of *B. megaterium* ;
- C3: 30×10⁸cfu/mL of *B. megaterium*.

Different higher case letters indicate significant differences between in the mixture and in the monoculture treatments at $P < 0.05$. Different lower case letters indicate significant differences among different concentrations of *B. megaterium* at $P < 0.05$ (n=10).

Bacillus are natural soil bacteria that bind to the plant's roots, allowing better uptake of nutrients by the plants and thus improving their growth.

Like some invasive plant, *Ambrosia artemisiifolia* grows at the expense of other endemic species such as *Setaria viridis*, the green foxtail.

In this study from Hebei University (China), the purpose is to determine if the qualitative or quantitative difference in *Bacillus* populations provides a competitive advantage for *A. artemisiifolia* over *S. viridis*.

Results show that the *Bacillus* presence in *A. artemisiifolia* rhizosphere, and more specifically *B. megaterium* presence, improves competitiveness of the plants and reduces the one of *S. viridis*. This is thought to be due to a change in soil carbon, nitrogen and phosphorus concentrations.

During *A. artemisiifolia* growth, *B. megaterium* concentration around the roots increase. Thus, the level of available nutrients in the rhizosphere also increase. The plant thus better absorbs nitrogen and phosphorus and becomes more competitive.

PLANTS EXTRACTS FOR THE PINE PROCESSIONARY CATERPILLAR MANAGEMENT

Pine processionary caterpillar expansion has several negative impacts : it causes trees decline due to defoliation, and the urticant silks are the source of strong allergic reactions for sensitive humans and animals.⁴

Existing management strategies for processionary species are still insufficiently selective or difficult to implement (nest destruction, insect traps, predator...). As for chemicals insecticides, they can have impacts on human health and the environment by impacting non-target species or by creating chemical resistance in caterpillars.

Several scientists have been working on the use of essential oils as "organic" insecticides. Essential oils provide the benefit of not concentrating in the environment and have a wide range of activity, which reduces the risk of developing resistance.

Many studies have been done on the Pine processionary moth. They have shown that Lamiaceae's components based products (lavender, oregano, thym, etc.) were highly efficient on pine processionary caterpillar. Moreover, those products are more efficient on 3rd, 4th and 5th larval stages.

Compared to other pests, research on the use of essential oils on processionary caterpillars is still at the beginning. The best is yet to come...

INFORMATION SOURCES

1. French Ministry for Solidarity and Health, [French regulation website](#)
2. KERMAREC et al. (2008), [Les risques sanitaires liés à la présence d'Ostreopsis ovata dans les eaux de baignade ou d'activités nautiques.](#)
3. Fengjuan Zhang et al. (2021) [Bacillus Benefits the Growth of Ambrosia Artemisiifolia by Increasing Available Nutrient Levels](#)
4. Faria, J.M.S. (2021) , [Control of Thaumetopoea pityocampa and T. wilkinsoni with Essential Oils and Respective Volatile Monoterpenoids.](#)

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Former Ragweed Observatory letters can be consulted [here](#)

SHORT NEWS

- **Ambrosia in Europe, EMAPI 2019** : go watch our last video interview of Tuvia Yaacoby (**Israel**), on **YouTube**.
- **IRS CONFERENCE** will take place in Budapest on **September the 8th & 9th of 2022**. You can answer for the call of abstracts online : <http://internationalragweedsociety.org/irs2022budapest/>



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