

## Equine Atypical Myopathy (EAM)

Atypical Myopathy is a seasonal disease, which is now well established in France and Europe. This disease affects and destroys postural, respiratory and heart muscles. Recent studies have shown the cause to be a toxin in the seeds of certain Acer trees, especially *Acer pseudoplatanus* or Sycamore tree.

By **Dominique VOTION** | 02.05.2018 |

Technical level   



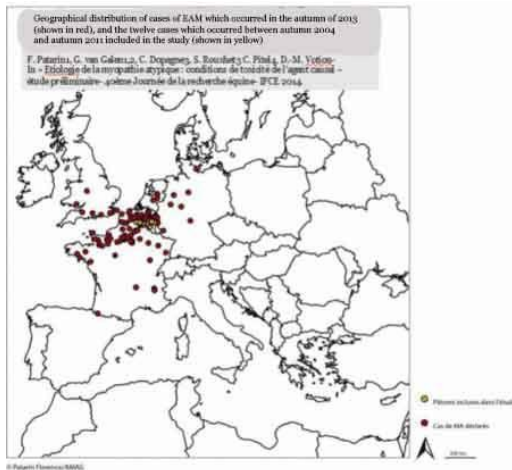
### What is Equine Atypical myopathy?

**Atypical myopathy (EAM)**, is also called **atypical myoglobinuria** of horses at grass is a frequently fatal disease, where **different muscle groups are severely affected and degenerate rapidly**. The groups of muscles include postural, respiratory and cardiac muscles.

EAM affects equines of all breeds (draught horses, sport horses, ponies, donkeys and Zebras) who are out grazing most of the time.

EAM is not a contagious disease. However, as its appearance is linked to environmental conditions, horses grazing in a same field can be affected simultaneously. This disease appears mainly in **Spring and Autumn**.

## Situation in Europe



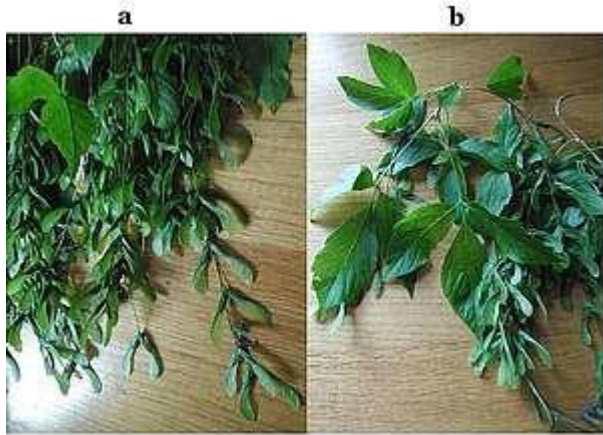
Geographical distribution of cases in Europe (between autumn 2004 and autumn 2013) © F. Patarin (source : AMAG)

Austria, France, Germany, Belgium, Denmark, Luxembourg, Ireland, the Netherlands, The United Kingdom, Switzerland, Spain, and the Czech republic have all been affected since 2006 to 2015.

In North America, a disease presenting the same symptoms has been identified in The USA, where it is named "seasonal pasture myopathy".

## What are the causes of Equine Atypical Myopathy?

It is now commonly accepted that the cause is an environmental toxin which affects the muscular metabolism.



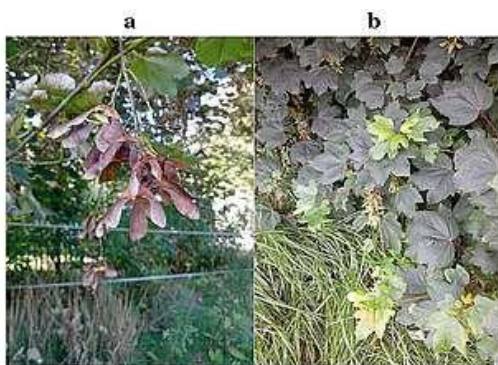
Samara (seeds) (a), and leaves (b) of *Acer Negundo* © F. Patarin

In The USA, seasonal pasture myopathy has been linked to the presence of a toxin called **Hypoglycina**, which is found in *Acer Negundo* (Boxelder) seeds.

In Europe this amino acid is also found in the seeds and seedlings of ***Acer pseudoplatanus* or sycamore trees**, which are most frequently linked to atypical myopathy cases in France and Belgium. However *Acer Negundo* (Boxelder) is an invasive species, which is expanding rapidly, especially in the south-west of France, and could therefore also be the cause of atypical myopathy in Europe.

The *Acer pseudoplatanus*, can reach a height of 20 to 30m. Its leaves are dark green with 5 rounded, palmate lobes. It is found in mixed forests of western Europe, through to the Baltic sea. The helicopter-shaped seeds (samara) promote wind dissemination, which increases the area affected by a tree or grove of trees.

Once hypoglycin A has been ingested, it is metabolised and becomes a highly toxic compound "MCPA-CoA", which causes severe biochemical disorders.



Samara (a) and leaves (b) of the sycamore tree © F. Patarin



Seedlings of *acer negundo* (boxelder) in the spring © D. Votion.

## **What are the clinical symptoms of Atypical Myopathy (EAM)?**

| <b>Symptoms in over 50% of cases</b>  | <b>Clinical signs in less than 50% of cases</b>  |
|---|--|
| Dark brown urine emissions: spontaneous or following a rectal examination or when a catheter is used. (93%) | Respiratory problems (49%)                       |
| Congested mucous membranes (red) (53%)  | Hypothermia: rectal temperature below 37°C (29%) |
| General weakness (85%)  | Anorexia (28%)                                   |
| Stiffness (83%)   | Horse has trouble swallowing (23%)               |
| Depressed appearance (80%)  | Exacerbated appetite (18%)                       |
| Higher heart beat frequency: > 45 heartbeats/minute (79%)   | Hyperthermia: rectal temperature >38°C (11%)     |
| Recumbency (78%)  |  |
| Still have an appetite (72%)  |  |
| Muscle trembling (68%)  |  |
| Sweating (64%)  |  |
| Normal temperature : 37-38°C (60%)  |  |
| Distended Bladder (58%)   |  |

## **How can the disease be avoided?**

It appears difficult to eliminate samara from fields. Even if there are no Acer trees planted near the fields, the helicopter shaped seeds can travel up to 100m from the tree on the wind.

Advice resulting from epidemiological studies:

- Supplement horses living out at pasture
- Reduce the time spent in the pastures during the high risk seasons
- Stable horses when there is a lot of rain or strong winds
- Give access to a salt lick
- Use water from the water network, clean out the drinking troughs on a regular basis.

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- Developing a test, from a blood sample, to enable confirmation of diagnosis and establish a survival prognosis

### Recognize your Acer trees from observing

All Acer trees are not incriminated! In order to assess the risk, you need to recognize those that surround your pastures.



Leaves and sycamore inflorescence (*Acer pseudoplatanus*) Dangerous! © D. Votion



Leaves and inflorescence of field maple tree (*Acer campestre*) Inoffensive © D. Votion



Leaves and inflorescence of Norway maple tree (*Acer platanoides*) : The flowers change quickly to samara © D. Votion

## **Treatment**

**There is currently no known antidote for the toxin.** A symptomatic treatment is therefore implemented: administering vitamins and anti-oxidants to support muscle function, and the energetic imbalance of the metabolism. Energy intake should be given with sugars, since the horse's muscles cannot temporarily use lipids.

## **Surveillance network**

Since 2005, there is an alert network for atypical myopathy: AMAG (**Atypical Myopathy Alert Group**). Set up and managed by the Liège University (Belgium), this group includes research scientists, and European veterinarians confronted with EAM.

Since 2002, when the first cases were diagnosed in France, the (RESPE: [www.respe.net](http://www.respe.net)) (Epidemio-surveillance network in Equine pathology) also takes an active part in the European network.

AMAG collects epidemiological and clinical information from horse owners and veterinarians (practitioners, in private clinics and universities) and keeps the professionals in the horse sector updated on any clinical outbreaks. Information can be found on the website: <http://labos.ulg.ac.be/myopathie-atypique/>

If you are aware of a case, PLEASE declare it:

- As an owner via the following link: <http://labos.ulg.ac.be/myopathie-atypique/questionnaire-propretaire/>
- As a veterinarian, via the following link: [http://labos.ulg.ac.be/myopathie-atypique/diagnostic\\_veterinaire/](http://labos.ulg.ac.be/myopathie-atypique/diagnostic_veterinaire/)

## About our writers

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