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Why some flies prefer darker horses

The bay horses in your pasture may have more trouble with biting flies than their lighter colored herdmates, according to new research from Hungary.

In a series of experiments conducted at Eotvos University in Budapest, researchers sought to determine which coat colors attracted the most attention from insects in the tabanid family, which includes such pests as horseflies and deer flies.

In the first experiment, the researchers hung out a brown cloth on a bright, sunny day. One side of the cloth was matte, and the other was covered with a plastic sheet to make it appear shiny. The researchers then counted the number of tabanids that landed on each side over the course of several hours. The next day the experiment was repeated, but with a white cloth instead. Finally, the researcher repeated the test in a shady area.

The next experiment involved white, light gray, medium gray, dark gray and black plastic trays filled with vegetable oil. The trays were left out in a sunny area on a horse farm daily from July to September. Each evening, the insects caught in the oil were removed and identified species by species.

The researchers also spent a sunny June day observing the reactions of a bay and a white horse to insects, mainly tabanid flies, in their pasture. They logged the amount of time each horse spent in the sun and shade and took 70 digital pictures of each at various times of the day and counted tabanids visible in the high-resolution images.

Based on the findings from these experiments, the researchers concluded that tabanids are more attracted to brown horses than to white ones. This, they say, is because of how light is reflected off these coat colors. Tabanids, explains Gabor Horvath, PhD, use reflected, polarized light from the coat as a signal to find a host.

TAKING A SHINE: Bay, black and other dark coats reflect highly polarized light, which horseflies, deer flies and other tabanids find attractive.

"If unpolarized light, such as sunlight, is reflected from a surface, such as a horse's coat, it becomes partially linearly polarized," says Horvath. "White-coated horses reflect weakly polarized or unpolarized light, while dark-coated horses reflect highly polarized light, depending on the direction of reflection.

"Both female and male tabanids are attracted to horizontally polarized light. The higher the degree of polarization of such light, the stronger the attraction

Reference: "An unexpected advantage of whiteness in horses: the most horsefly-proof horse has a depolarizing white coat," *Proceedings of the Royal Society B,* January 2010

to tabanids. Thus, dark-coated host animals are inevitably more attractive to polarotactic tabanids than bright-coated hosts."

Horvath and his colleagues add that the tabanids were more attracted to the halves of the cloths covered in plastic than to the matte halves, which suggests that color is only one factor in attraction. "The coat of horses is not so rough as the matte cloth used in our experiments," he says. "We used matte cloth in order to reduce the polarization of reflected light. A brown matte cloth was unattractive to tabanids, while the same cloth became attractive when covered by a colorless, transparent plastic sheet. This shows that the polarization, rather than [just] the brightness or color, was attractive to tabanids."

The researchers' observations of the live horses confirmed the experiments' results. Almost four times as many tabanids were observed on the brown horse than on the white horse. In addition, the dark horse spent twice as much time in the shade, where the insects are less active. "In sunshine the predominant light source is the sun, while in the shade it is the sky," explains Horvath. "The direction of incidence, the intensity and the color of sunlight are quite different from those of skylight [affecting how the light is reflected off the horses' coats]."

Horse owners can use all this information to protect their darker colored horses from an onslaught of tabanids during the summer. "If one wants to protect dark-colored horses from polarotactic tabanid flies, it is advisable to cover them with a matte white cloth, which reflects weakly polarized light or unpolarized light, and thus attracts fewer tabanids than the dark coat itself," says Horvath.

New clues to a baffling illness

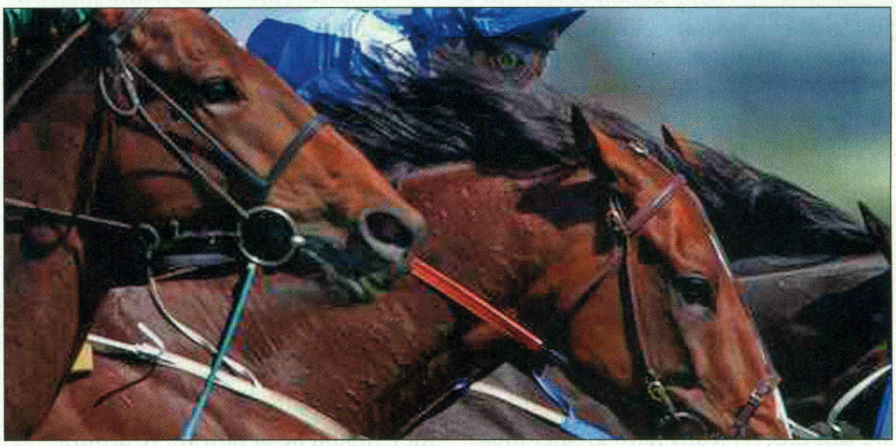
Swiss researchers may have discovered a link between a deadly disease known as equine atypical myopathy (EAM) and a common soil bacterium called *Clostridium sordellii*.

First identified in Northern Europe and the United Kingdom in 1984, EAM is characterized by sporadic, intense muscle cramping in horses. The condition eventually leads to kidney failure and toxic shock as destroyed muscle cells and related debris accumulate in the body. EAM is reported to be fatal in nearly 90 percent of cases.

The cause of EAM has long been a mystery, but researchers at the University of Bern now have evidence that a toxin produced by *C. sordellii* is responsible. In addition to causing toxic shock syndrome in women, the *C. sordellii* toxin has been proven in laboratory settings to produce muscle damage in mice. Using electron microscopes, the Swiss researchers discovered damage to skeletal and heart muscles of EAM-affected horses similar to that found in infected mice. They also found antibodies specific to the bacterium's toxin in tissue samples of affected horses. Similar testing of horses with other types of muscle disorders did not turn up evidence of the toxin.

Although the link is not yet conclusive, the researchers are calling for further investigation into the role of *C. sordellii* in EAM. Knowing more, they say, can help lead to the development of a vaccine or a means of detecting contaminated pastures.

Reference: "Lethal toxin of *Clostridium sordellii* is associated with fatal equine atypical myopathy," *Veterinary Microbiology*, February 2010



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Genetic test for speed?

For centuries, managing the careers of Thoroughbred racehorses has been more art than science. Now, however, trainers can use a genetic test to determine the optimum racing distance for an individual horse based on a variation of a specific muscle-growth gene.

"The test identifies which version of the myostatin gene [MSTN] a particular horse has," explains Emmeline Hill, PhD, a genetics researcher at University College Dublin in Ireland and co-

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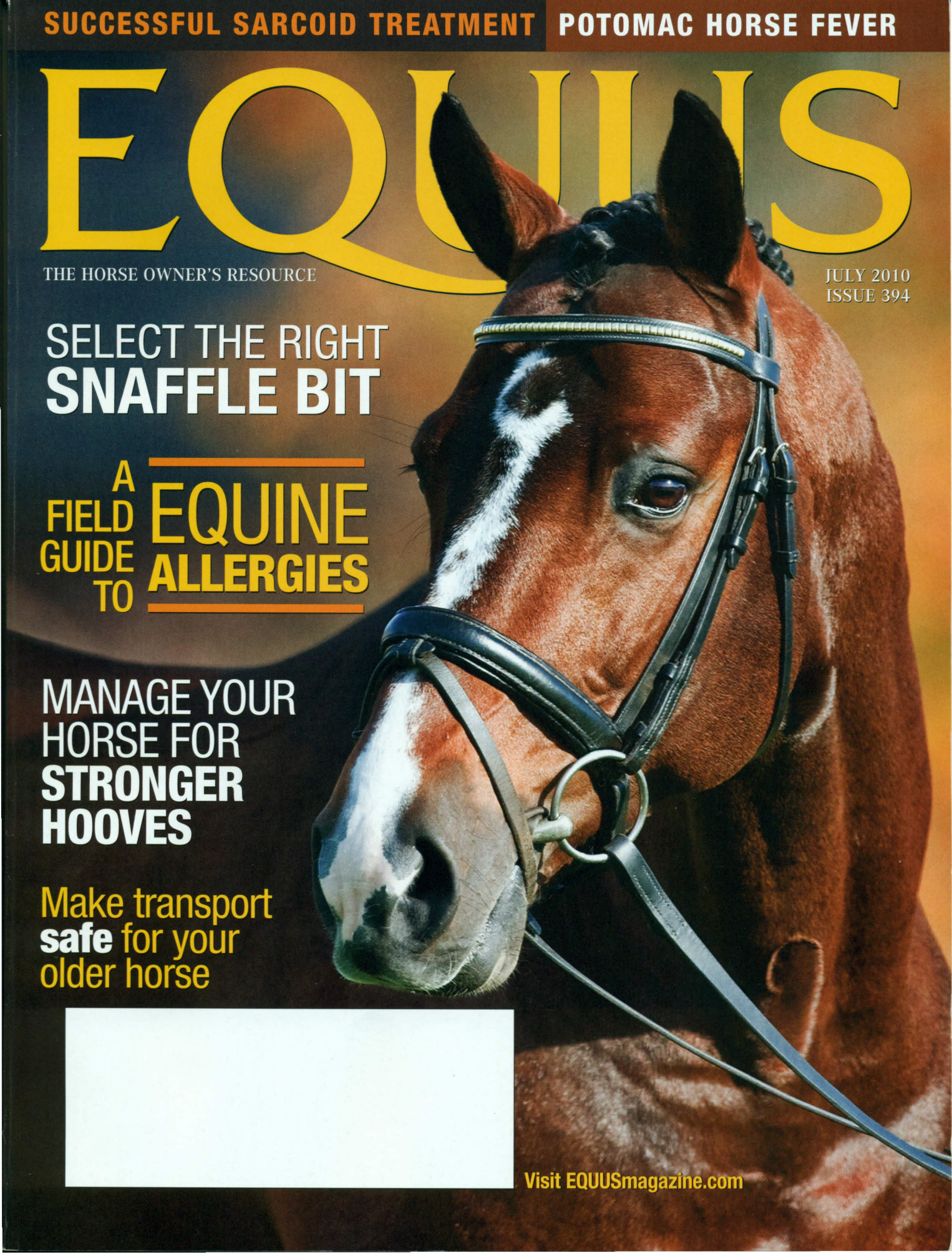

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