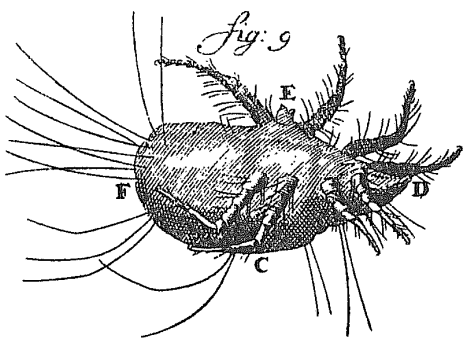
Scrambling About on Cheese

Mites provide the tangy taste of a delicacy with a rich tradition

Würchwitz mite cheese (Milbenkäse) is a local cheese specialty from Saxony-Anhalt which is undergoing a renaissance thanks to the slow-food movement. You have to examine the cheese under a microscope to see what is really in there: cheese mites. The diminutive arachnids play an important role in the aging process of this delicacy.



Tyroplyphus siro L. (syn. Thyrophagus casei) An arachnid of the mite family.

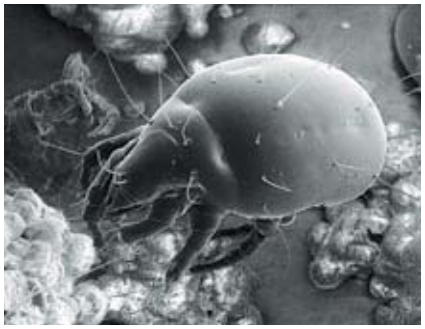
Admittedly, Würchwitz mite cheese is an unusual food. The former East German government regarded the cheese as thoroughly unhygienic. Therefore, its manufacturing and sale were prohibited, although this form of cheese-making has a more than 500 year-old tradition in the region of Würchwitz, a village near Leipzig. But times have changed. Today, the mites are once again welcome in many Würchwitz households to lick the cheese in order to produce the typical tangy taste.

Helmut Pöschel regularly makes mite cheese for sale. And the retired biology teacher doesn't mind people looking over his shoulder. A stainless steel bowl with fresh low-fat curd sits on a round table in his kitchen. Pöschel adds caraway and salt and then sprinkles in cuttings from dried elder blossoms. He mixes the ingredients with his hands. From this mass of curd, he forms logs about eight centimeters in length and places them on a wooden board to dry. Pöschel gets the curd from regional bio-farmers or from a South Tyrolean alpine meadow. For a good reason, because his mites do not care for West German curd. "It has too many preservatives," explains the cheese maker, "the mites lick it once and keel over dead."

Everything about mites. Helmut Pöschel doesn't only make cheese, he also collects curios related to these arachnids. His collection is on display in his private one-room museum in a converted pig sty: a painted portrait of a cheese mite, tiny medals for worthy cheese mites who flew into space as cosmonauts on the International Space Station, a mite mausoleum, jewelry made of ancient "Milbenkäse" that resembles amber. There is no question that the 62-year old museum director is always up for a good joke. He also produces short films. In the past, he concentrated on movies that were critical of the Communist regime as well as erotic films – something which brought him to the attention of the former East German secret police – but today he mainly focuses on documentaries and satires. One of his most recent movies with local color is a parody of the Danish Olsen Gang films. The plot of the movie is the theft of – what else? – mite cheese!

There's life in the box. As soon as the curd logs are dry, Helmut Pöschel takes them to the cheese room, which looks like a regular pantry: tiled floor, shelving against the wall, fly-screens in the windows. It smells like resin cheese with a hint of ammonia and urea. Pöschel places the

Thousands of cheese mites wait in a wooden box for the fresh curd.



A cheese mite under the scanning electron microscope.

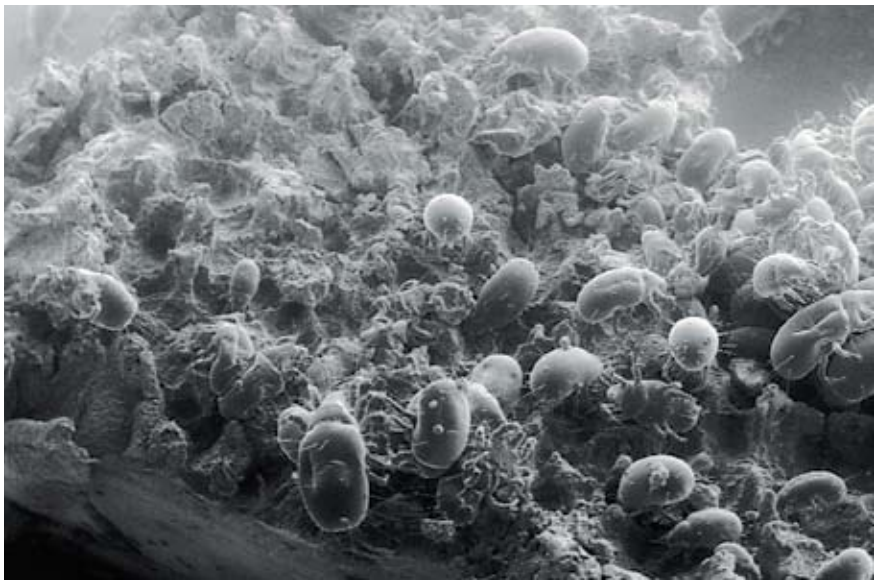
green cheeses in one of the wooden cheese boxes. Here, thousands of cheese mites, which now turn their attention to the fresh curd, crawl around in a brown crumbly mass.

The mites crawl onto the surface of the cheese-in-the-making and insalivate the curd. This causes the curd to ferment, acquire its typical taste and long shelf-life of several months. To keep the mites from eating too much of the cheese only allowing them to ferment it, Pöschel adds freshly ground rye flour every day, which serves as nutrient for the mites. The cheese manufacturer is closely monitored by the regulatory authorities and his products are microbiologically tested. But so far no troublesome fungi or bacteria have been found. Presumably, the mites excrete certain substances in their saliva which prevent the growth of bacteria and fungi.

Pöschel closes the lid of the cheese box. The aging process takes about three months, after which the cheese is ready.

Enjoy with rye bread and pears in white wine. The fans of mite cheese are convinced of its health-promoting effect. The culinary specialty is said to be beneficial for digestive problems and diarrhea and its regular consumption presumably helps desensitize you to household dust mite allergies. The slow-food movement has discovered this delicacy as well. The renowned Hotel Elephant in Weimar offers the following on its menu: "Mite cheese from Würchwitz with pears in white wine sauce and thick rye bread." Those who don't want to eat the mites themselves can simply tap them off or slice off the brown, crumbly cheese rind. Or just don't look at the food too closely.

Upon closer examination. A mite cheese from Würchwitz has arrived in Oberkochen near Ulm. Dr. Michael Hiltl, an application specialist working for Carl Zeiss, takes the cheese to his laboratory, a dark room which houses a ZEISS *EVO*© *60* scanning electron microscope. He means to examine the living mites on the cheese surface under the microscope. He puts a piece of cheese rind on a specimen holder and places it in the scanning electron microscope's specimen chamber. As soon as a sufficient vacuum is produced on the inside of the microscope, things can get going. Hiltl selects the low-vacuum mode, activates the electron beam and looks for a suitable image detail. His hands fly across the keyboard. He changes the magnification, focuses the image, modifies the brightness and contrast, adjusts the scan speed, turns the focus button again. A cheese mite magnified 500-fold appears on the microscope's monitor. Four pairs of legs become visible, as well as the mandibles and the fine



The cheese surface with the living mites is examined microscopically.

The keyboard for the electron microscope.

The mite monument in Würchwitz.

hairs on the surface of the mite's body. Hiltl optimizes the noise suppression and saves a series of images on the hard drive.

The advantage of the scanning electron microscope compared to the light microscope is its higher magnification and much better depth of field. This allows a larger range of depths to be in focus with one setting, while the light microscope would need to be re-focused continuously.

The mites scramble across the cheese surface, kicking their legs. Michael Hiltl must work fast because the conditions in the specimen chamber of the scanning electron microscope are life-threatening: vacuum and permanent electron bombardment. Even the strongest of mites can only endure this for a few minutes at most. But the video has been taken successfully! Now Michael Hiltl could eat the rest of the mite cheese; but he hasn't tried it yet. "I don't eat any cheese," he confesses.

A Very Large Small Animal. Some seven years ago, a cheese mite sculpture made of Carrara marble was placed at the village entrance of the 600-resident community of Würchwitz. The piece of art is not without controversy: because some people had preferred to use the community funds to improve the poor-quality roads of the town.

The white marble glitters in the spring sun. As he has done countless times before, Helmut Pöschel places an aged piece of mite cheese in an opening at the rear of the mite cheese monument. This way, passing tourists can sample the cheese's aroma. And there comes the postman, carrying a letter from Oberkochen: a DVD containing some well-focused videos of the Würchwitz cheese mites.

Ingrid Fritz

You can watch a short film at www.zeiss.com/innovation

The details

The Cheese Mite

Tyroplyphus siro L. (syn. Thyrophagus casei) An arachnid of the mite family. Related to the flour mite and the dust mite. Presumably, hundreds of years ago man made a virtue out of necessity when it was discovered that exposure to mites gave cheese a long shelf-life. As early as 1694, Dutch researcher van Leeuwenhoek observed cheese mites using the light microscope he invented.

The EVO 60

Unlike traditional scanning electron microscopes (SEM), the EVO 60 is a low-vacuum scanning electron microscope. Using this technology, even electrically non-conducting objects can be examined. Air or pure nitrogen gas is piped into the specimen chamber so that ions are produced when the electron beam hits the gas molecules. The (positive) ions neutralize the excessive negative charge on the specimen. Time-consuming preparation of non-conducting or wet specimens is therefore not necessary.