



Microbiology bulletin 10

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5 new strains of *Listeria* discovered

In America, Cornell University researchers have identified five new species of *Listeria*.

The new study, published in the *International Journal of Systematic and Evolutionary Microbiology*, suggests that all five newly identified species are non-pathogenic.

The research was part of a larger study led by researchers at Colorado State University and Cornell to examine the distribution of *Listeria*, *E. coli* and *Salmonella* in agricultural and natural environments. Samples were taken from fields, soil, ponds and streams in New York, Colorado and Florida.

To identify the five new species, the researchers applied molecular biology methods, including full genome sequencing.

The five newly identified species add more evidence to the existence of four distinct evolutionary branches of *Listeria*.

Of the five newly identified species, one was named *Listeria cornellensis*, a rare addition to a small list of organisms named after the eponymous institution where the research was conducted.

Salmonella outbreak in Wales linked to laverbread.

Five new cases of *Salmonella* with possible links to laverbread (seaweed and oatmeal cake), have emerged in the last few weeks bringing the total number to 17, according to Public Health Wales. Tests are continuing to confirm whether they are all linked to the outbreak, which has nine confirmed cases so far. Cases have been reported across south and west Wales.

Three people have needed hospital treatment, but have been discharged.

Using Radio Waves to kill bacteria

Research studies by scientists in America at the Agricultural Research Service and Princeton University have found that raw eggs artificially infected with *Salmonella* bacteria can be decontaminated by using radio waves, and that these waves, combined with water heat treatment is effective in removing the bacteria without affecting the physical properties of the product.

More Bearded Dragon warnings

After the warnings issued in the UK (highlighted in the March bulletin), the CDC in America have reported that 132 people from 31 states have contracted *Salmonella* from contact with their

pets. The outbreak strain is *Salmonella cortham*, which is exceedingly rare.

Development of bacteriophage treatments to treat *E coli* 0157:H7 contamination in beef

Further research has been carried out into the effectiveness of treating beef products with bacteriophages specific for *E coli* 0157:H7 (see the October 2013 bulletin). Researchers at Purdue University have published an article in the Journal of Animal Science describing the effectiveness in controlling the growth of 0157:H7 by use of bacteriophages. They note however that some resistant strains of the bacteria have evolved and suggest that further studies are needed to develop resistance mitigation strategies to optimize phage-based technologies.

New research shows how *E coli* 0157:H7 binds to vegetables

Food-poisoning outbreaks linked to disease-causing strains of the bacterium *Escherichia coli* are normally associated with meat products. However, between 20-30% of these are caused by people eating contaminated vegetables, as was seen in the 2011 STEC outbreak in Europe that caused 53 deaths. Research presented at the Society for General Microbiology's Annual Meeting in Liverpool shows that the disease-causing *E. coli* 0157:H7 interacts directly with plant cells, allowing it to anchor to the surface of a plant, where it can multiply.

Researchers from the James Hutton Institute in Scotland have identified that *E. coli* 0157:H7 use their flagella to penetrate the plant cell walls. The team showed that purified flagella were able to directly interact with lipid molecules found in the membranes of plant cells. *E. coli* bacteria lacking flagella were unable to bind to the plant cells.

Possible reservoir and routes of transmission of Cronobacter

Recent research may have identified a natural reservoir of Cronobacter as being wheat flour. *Cronobacter* spp. (formerly *Enterobacter sakazakii*) are an important group of emerging opportunistic foodborne pathogens that may cause rare but severe systemic infections such as neonatal meningitis, septicaemia, and enterocolitis in neonates.

The researchers conclude that care should be taken while preparing infant foods or formulas in order to avoid cross-contamination from this source.

An increase in notifications of *Vibrio parahaemolyticus* in Atlantic coast shellfish

In America the Centre for Disease Control (CDC) have released a summary of the common causes of foodborne infections in 2013, and have highlighted an increase in the number of infections caused by *Vibrio parahaemolyticus*. Interestingly, a strain which until now has only been detected in shellfish caught in the Pacific Ocean (Pacific North West) is now being detected in Atlantic shellfish.

The number of annual of *Vibrio parahaemolyticus* strains traced to Atlantic caught shellfish in 2012/3 is triple the pre 2011 number, and the CDC estimate that for every case of *Vibrio parahaemolyticus* reported there are 142 cases undiagnosed.

The Pacific North West strain is possibly becoming endemic in an expanding area of the Atlantic Ocean but the mechanisms for this introduction are not known.

Could this be another consequence of global warming causing sea temperatures to rise?