TEMPERATURE
2016, VOL. 3, NO. 1, 41–42
http://dx.doi.org/10.1080/23328940.2015.1130521

Taylor & Francis
Taylor & Francis Group

FRONT MATTER: LETTER

OPEN ACCESS

Hot stuff – do people living in hot climates like their food spicy hot or not?

Letter on: Romanovsky AA. Protecting western redcedar from deer browsing—with a passing reference to TRP channels. Temperature 2015; 2:142-9; http://dx.doi.org/10.1080/23328940.2015.1047078

Dear Editor-in-Chief,

This is a letter in reply to the article by Romanovsky, A.A. "Protecting western red cedar from deer browsing-with a passing reference to TRP channels."[1] Temperature 2015; 2:2, 142-9, http://dx.doi.org/10.1080/23328940.2015.1047078. In common folklore there seems to be a paradox with people living in hot climates liking their food "hot" (spicy), whereas most cuisines under more temperature climates are relatively bland? This paradox has been an enigma among writers, scientists, and chefs for a very long time. If one looks at a map of global cuisine, there is a pattern: the hotter the climate, the spicier the food – usually. On closer examination, there are exceptions to that observation. Let's take Spain as an example. This is a country that has several areas with a warm climate and yet hot chile peppers have never really caught on. Although Columbus discovered chile peppers on his first voyage to the Western Hemisphere, and brought them back to Spain.[2] Hot chile peppers never became a staple in Spanish cuisine. Once the Portuguese introduced them to India and other countries in Asia, chile peppers became integrated into Asian cuisines. The chile peppers and cuisines in Puerto Rico, Columbia, and Venezuela are also known to be very mild despite the countries hot climate.

There may be more than one answer to this paradoxically odd observation. The heat sensation in chile peppers is caused by capsaicinoids: 22 closely related alkaloids, found only in chile peppers.[3] Capsaicinoids are members of the vanilloid family of molecules that bind to a receptor called the "transient receptor potential cation channel subfamily V member 1," also known as the capsaicin receptor and the vanilloid receptor 1, which is encoded by the TRPVR1 gene.[4] Upon binding to the TRPVR1 receptor, the sensation produced by the capsaicinoid molecule is the same sensation that heat would cause, which explains the chile pepper's burn.

One reason given for consuming chile peppers in a hot climate is that chile peppers make you sweat, and sweating cools you down. Perspiration is a physiological reaction to heat. Raising body temperature, whether from the surroundings or from exercise, triggers a series of feedbacks between the brain and the body, causing sweat glands to go to work. Perspiration evaporating off the skin cools the body. Eating chile peppers doesn't actually raise body temperature, but the brain is tricked by the capsaicinoids to produce perspiration. However, anyone that has visited or lived in a hot humid climate can testify that perspiring in a humid climate has only a minimal cooling effect.

Another explanation could be agricultural. Chile peppers grow well in hot climates, and so people who live in places where chile peppers grow well eat a lot of them. Chile peppers are very productive in those areas, so they're common, and it just makes sense that people living in these areas would use a lot of chile peppers in their cuisine.

One of the most plausible explanations comes from Paul Sherman's group at Cornell University, who believe it is a form of Darwinian medicine.[5] It is the antimicrobial and antiparasitic properties of chile peppers that help protect people from spoiled foods. Hot climates make food spoil faster, and spices including chile peppers help prevent food from spoiling. From an evolutionary perspective, the people who prepared spicy dishes had a higher chance of survival. If you live in Sweden, and you had reindeer meat to preserve, one could let it hang outside in

winter. In warm climates, and before refrigeration, it was hard to preserved food. Chile peppers with their antimicrobial properties, makes the food less likely to spoil.[6] This is especially helpful in hot climates, where the warm temperatures cause food to spoil very quickly. Quite possibly this might make people who eat spicy food healthier, giving some evolutionary benefits. Sherman's team found that many spices including chile pepper extracts inhibit a number of microbial pathogens of food-borne bacteria and fungi. Capsaicinoids in particular killed or inhibited up to 75 percent of all bacteria in food. Thus, people who live in warm climates could be attracted to spicy foods because it keeps them healthy.

As varied as these explanations may be, I believe there is one overriding reason why people eat chile peppers, whether in warm or cool regions, and that is they make us feel good. The capsaicinoids trigger a pain sensation, then the body blocks the pain with endorphins. The receptors not only send a signal for "hotness," but the capsaicinoids also trigger the release of another chemical messenger, substance P, which signals the brain about pain. The nervous system telegraphs a signal to the brain to flood the nerve endings with endorphins, the body's natural painkillers. The release of endorphins give the body a sense of pleasure. It is for this feeling of pleasure that people all over the world consume chile peppers. Humans do what makes them feel good, and they learn from each other. People in hot climates felt better after eating food that was "hot," and because they felt better they learned to like spicy hot food, and thus developed a preference for it. Today, it is not only hot regions, but even the cool regions – Northern Europe, Canada, even Iceland, who are consuming lots of chile peppers. Chile peppers are conquering the world, and making all of us happier along the way.

References

[1] Romanovsky AA. Protecting western red cedar from deer browsing-with a passing reference to TRP channels. Temperature 2015; 2:142-9; http://dx.doi.org/10.1080/23328940.2015.1047078

[2] Bosland PW, Votava EJ. Peppers: vegetable and spice capsicums. 2nd edition. CAB International, United Kingdom 2012:230 pp

[3] Zewdie Y, Bosland PW. Capsaicinoid profiles are not good chemotaxonomic indicators for Capsicum species. Biochem Systematics Ecol 2001; 29:161-9; PMID:11106844; http://dx.doi.org/10.1016/S0305-1978(00)00041-7

[4] Szallasi A, Cruz F, Geppetti P. TRPV1: a therapeutic target for novel analgesic drugs? Trends Mol Med 2006; 12:545-54; PMID:16996800; http://dx.doi.org/10.1016/j.molmed.2006.09.001

[5] Billing J, Sherman PW. Antimicrobial functions of spices: Why some like it hot. Quarterly Rev Biol 1998; 73:3-49; PMID:9586227; http://dx.doi.org/10.1086/420058

[6] Cichewicza RH, Thorpe PA. The antimicrobial properties of chile peppers (Capsicum species) and their uses in Mayan medicine. J. Ethnopharmacol 1996; 52:61-70; PMID:8735449; http://dx.doi.org/10.1016/0378-8741(96)01384-0

Paul W. Bosland

Chile Pepper Institute, New Mexico State University
Las Cruces, 88003, NM, USA
pbosland@nmsu.edu