

Gut feeling: Intestinal germ helps sushi digestion

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A handout photo provided by Nature shows two species of Porphyra (P. leucosticta - the large brownish leaf and P. linearis - the smaller redish leaves) gathered at low tide on the beach in front of Roscoff, Brittany. Japanese have an easy time digesting sushi and other seaweed-wrapped delicacies thanks in part to an intestinal bacterium that hijacked genes from a marine germ, scientists report.

Japanese have an easy time digesting sushi and other seaweed-wrapped delicacies thanks in part to an intestinal bacterium that hijacked genes from a marine germ, scientists report on Wednesday.

The surprising discovery has shed light on the trillions of friendly germs that inhabit our <u>gut</u>, living in mutual self-interest with us.

By breaking down starchy plant fibres, these bacteria get their share of nutrition -- as do we.



Researchers in France studying a marine bacterium, Zobellia galactanivorans, found it had an interesting new class of enzyme that busts open a starch molecule called porphyran, found in red seaweed of the Porphyra species.

Scanning publicly-available databases of DNA codes, the team were astonished to find genes coding for the same enzyme in an intestinal bacterium, Bacteroides plebeius, that so far has only ever been noted in the faeces of Japanese.

The scientists believe that B. plebius picked up the genes from a fellow <u>bacterium</u> that lived on seaweed.

In a classic example of Darwinian selection, strains of B. plebius that had the imported <u>genes</u> had a better chance of survival than others, as they could feast on a major component of the Japanese diet.

The Japanese eat around 14 grammes (half an ounce) of seaweed each day, and Porphyra, known as nori, which is used in sushi, is the most important food alga of all.

Recorded evidence of the central role of seaweed in the Japanese diet goes back to the eighth century, when tax archives showed that people could use the commodity as a means of settling their bill with the government.

The <u>human gut</u> is alive with bacteria that supply the body with energy by breaking down plant starch through carbohydrate active enzymes, or CAZymes, that the body cannot produce by itself.

"Traditionally, nori is not roasted, and thus contact with associated <u>marine microbes</u> is promoted through Japanese <u>sushi</u>," says the paper.



"Consequently, the consumption of food with associated environmental bacteria is the most likely mechanism that prompted this CAZyme update into the human gut microbe."

The study, led by Mirjam Czjzek of the Station Biologique de Roscoff, western France, appears in the British journal *Nature*.

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