PHOTOBACTERIUM: OUTSTANDING SPECIES OF BACTERIA. HAVE YOU EVER HEARD OF THEM?

ALEJANDRO ARIEL GARCIA ARRIAGA
COACALCO DE BERRIOZABAL ESTADO DE MEXICO, MEXICO

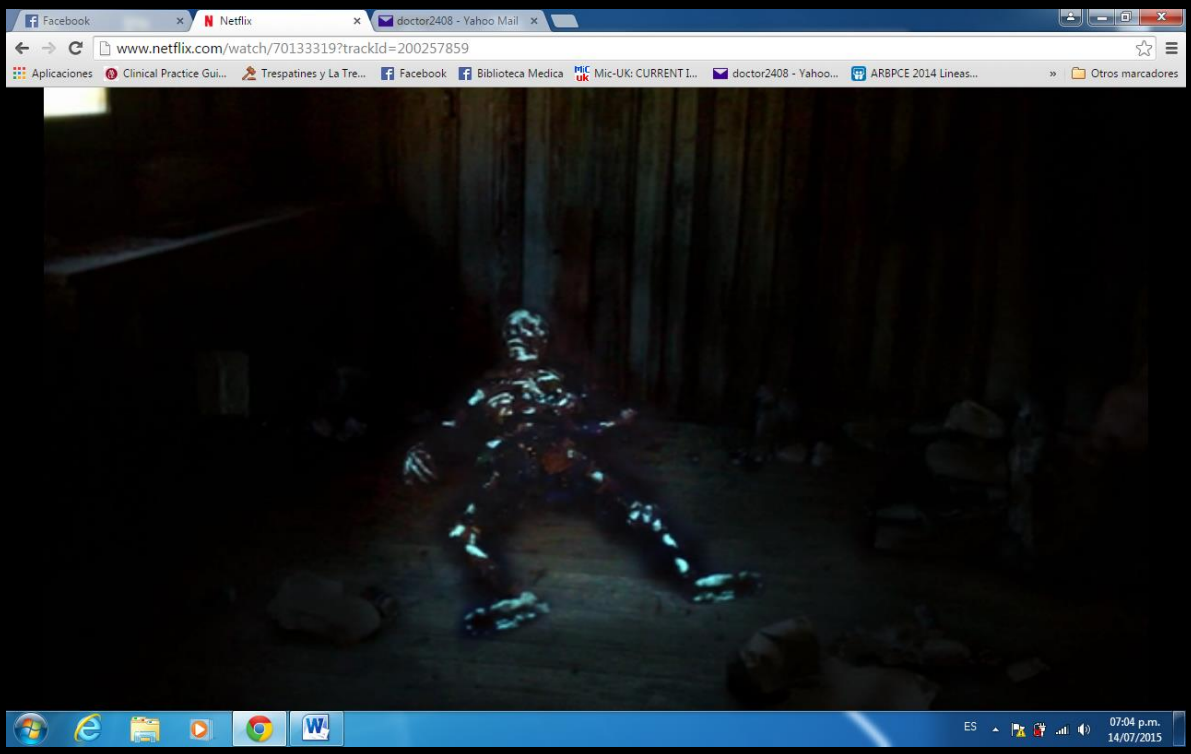
INTRODUCTION:

The first time that I heard of these microorganisms was on the TV series BONES that is broadcast on NETFLIX. The relevant programme is Episode 20 of the second season "The Glowing Bones in the Old Stone House" . In this episode the forensic anthropologist Temperance Brennan is called to see a corpse that was found in an old house. Here the FBI agent and the anthropologist entered with protection because of the fear that the glowing bones were emitting radiation. Nevertheless, since they did not find signs of radiation using a Geiger counter they took the corpse to the Jeffersonian Institute where the cause of the glowing was identified by another scientist Dr. Hodgins as *Photobacterium phosphoreum* and the character explains to their colleagues that it is a species of a group of bacteria that emit light.

Since much of what is said on a TV program may be just fiction I looked for the species mentioned and I found a lot of information about this kind of bacteria.

(Editor's note: The video stills used below are from the programme and used here under 'Fair Use' for critique and review. The images still remain the copyright of the production companies: Josephson Entertainment, Far Field Productions and 20th Century Fox Television.)

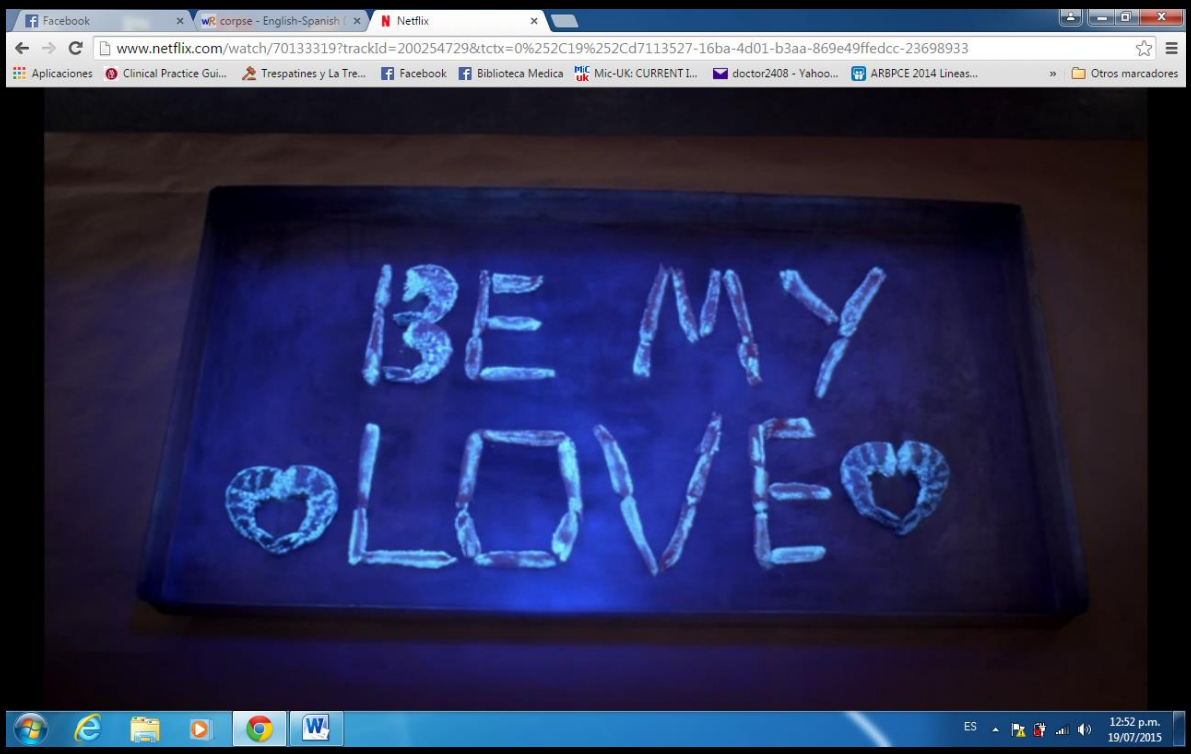
Here is the scene where the corpse with glowing parts appears.



Here is the scene where Dr. Hodgins identifies the bacteria.

Here is the scene where he explains and mentions that is *P. phosphoreum*

Here is the scene where Dr. Hodgins shows to another character Angela Montenegro who he has fallen in love with, a phrase made with the photobacteria that he had isolated from the corpse.



DEVELOPMENT:

Photobacterium do exist and they belong to the Family Vibrionaceae, the group which includes the terrible bacteria V*ibrio cholera* that has caused millions of deaths around the world. Most of these bacteria live in symbiosis with marine species but can be cultivated in large quantities in a Petri dish containing culture medium. As in nature they seem to glow in the darkness as if they were fluorescent, it is amazing isn't it?

Individually or in a small group they are just like any bacteria in that they need to be stained or enhanced with an illumination method because they are transparent. They are classified in fact as gram-negative bacteria.

The emission of light is a chemical oxidation reaction catalyzed by the enzyme luciferase this reaction produces a kind or blue-green light of 400-495 nm and corresponds *to Photobacterium phosphoreum* emission. Nowadays the species is known as *Vibrio phosphoreum* which was isolated for the first time in the 1880s by a Dutch microbiologist named Martinus Beijerinck.

The genus *Photobacterium* includes species such as *P. angustum, P. aplysiae, P. damselae, P. fischeri, P. frigidiphilum, P. ganghwense, P. halotolerans, P. histaminum, P. iliopiscariumal, P. indicum, P. leiognathi, P. lipolyticum, P. logei, P. phosphoreum, P. profundum, P. rosenbergii.*

PRESENTATION:

Unfortunately at this moment I do not have the possibility of isolating this kind of bacteria but the topic interested me since it is to some extent surprising and for me unknown until I saw the program mentioned above. So today images of this bacterium can be found on Google images.

CONCLUSION:

I would like to isolate this kind of bacteria and present an article with photos taken by myself. Nevertheless today I wanted to share just cultural data related to the marvelous world of miniature creatures that day after day surprise me more and more.

REFERENCES:

https://en.wikipedia.org/wiki/Photobacterium

http://web.mst.edu/~microbio/BIO221_2010/P_phosphorium.html

https://microbewiki.kenyon.edu/index.php/Photobacterium_phosphoreum

Email author: doctor2408 AT yahoo DOT com DOT mx

(Above in anti-spam format. Copy string to email software, remove spaces and manually insert the capitalised characters.)

Published in the August 2015 issue of Micscape Magazine. www.micscape.org