这种小虫子竟然是塑料克星？

Hungry waxworms that can eat through plastic and digest it too

At first glance, there's nothing particularly remarkable about waxworms. The larval form of wax moths, these pale wriggling grubs feed on the wax that bees use to make their honeycomb. For beekeepers, the pests are something to swiftly get rid of without a second thought.

But in 2017 molecular biologist Federica Bertocchini, who at the time was researching the embryonic development of vertebrates at the Spanish National Research Council, stumbled on a potentially game-changing discovery about these creatures.

Bertocchini, an amateur beekeeper, threw some of the waxworms in a plastic bag after cleaning her hive and left them alone. A short time later, she noticed the worms had started producing small holes in the plastic, which began degrading as soon as it touched the worms' mouths.

“It was a real eureka moment — it was brilliant,” Bertocchini says about the initial discovery and the realization of what it meant. The worms were doing something that we as humans find remarkably difficult to do: break down plastic. Not only that, but the worms appeared to be digesting the plastic as though it was food.

Bertocchini and her fellow researchers began collecting the liquid excreted from the worms' mouths. They found this "saliva" contained two critical enzymes, Ceres and Demeter — named after the Roman and Greek goddesses of agriculture, respectively — which were able to oxidize the polyethylene in the plastic, essentially breaking down that material on contact.

Today, 400 million tonnes of plastic waste is produced globally every year. Of that, 19 to 23 million tonnes (about 2,000 garbage trucks' worth) seep into aquatic ecosystems, where much of it is colonized by microorganisms or eaten by animals.

Letting these worms loose in a plastic-polluted environment could be dangerous to ecosystems, especially given their ability to destroy bees' hives, as Bertocchini notes. But she's hopeful that the enzymes these worms produce could help tackle the world's plastic pollution crisis.

Bertocchini is now chief technology officer at bioresearch startup Plasticentropy France, working with a team to study the viability of scaling up these enzymes for widespread use in degrading plastic.

Promising enzymes could be found in a number of different organisms. Some fungi and bacteria are known to digest plastics, but it is much rarer in complex animals. In 2022, another invertebrate was discovered to have a taste for plastic — the "superworm" Zophobas morio, which can put on weight from a diet of polystyrene.

Numerous global measures will be needed to reduce our reliance on and consumption of plastic. To this end, many countries have pledged to help reduce single-use plastic production and use, and a global plastics treaty is expected in late 2024.

But if enzymes like these can eventually be mass-produced to break down plastic, there could perhaps also be a role to play by the tiny critters.

1.wriggle /ˈrɪgl/

n. 扭动；蠕动；蜿蜒行进

【释】an act of wriggling

【例】He felt her shoulders give a wriggle of dissent. 他感觉她的肩膀扭动了一下，以示反对。

v.

1）扭动身体；扭来扭去

【释】~ (about/around) to twist and turn your body or part of it with quick short movements

【例】She wriggled her toes. 她扭动着脚趾。

【近义】wiggle v.（使）扭动，摆动

2）蠕动；甩动而行；蜿蜒行进

【释】to move somewhere by twisting and turning your body or part of it

【例】The fish wriggled out of my fingers. 那条鱼从我指缝中一甩身溜走了。

【用法】wriggle out of sth/out of doing sth 耍滑不做，逃避（应做的事）

【例】He tried desperately to wriggle out of giving a clear answer. 他竭力支支吾吾不给予明确的回答。

2.pest /pest/

n.

1）害虫；害兽；害鸟

【释】an insect or animal that destroys plants, food, etc.

【例】pest control 害虫防治

2）讨厌的人（或物）

【释】an annoying person or thing

【例】That child is being a real pest. 那个孩子真讨厌。

3.“不假思索”的英文表达：

without a second thought

without thinking/hesitation

off the top of one's head

instinctively

automatically

reflexively

4.embryonic /ˌembriˈɒnɪk/

adj. 胚胎期的；萌芽期的；未成熟的

【释】in an early stage of development

【例】The plan, as yet, only exists in embryonic form. 这个计划迄今为止还只是在酝酿之中。

5.“game-changing”的同义表达：

paradigm-shifting 打破范式的

revolutionary 革命性的

transformative 变革性的

groundbreaking 突破性的

pioneering 开创性的

trailblazing 开拓性的

disruptive 颠覆性的

6.amateur /ˈæmətə(r)/

n.

1）业余爱好者；业余运动员

【释】a person who takes part in a sport or other activity for enjoyment, not as a job

【例】The tournament is open to both amateurs and professionals. 这次锦标赛业余选手和职业选手均可参加。

2）生手；外行

【释】a person who is not skilled

【例】This work was done by a bunch of amateurs! 这项工作是一帮外行干的！

【反义】professional n. 内行，专家

adj. 业余爱好的

【释】doing sth for enjoyment or interest, not as a job

【例】an amateur photographer 业余摄影爱好者

7.degrade /dɪˈɡreɪd/

v.

1）降低……身份；侮辱……的人格；使受屈辱

【释】to show or treat sb in a way that makes them seem not worth any respect or not worth taking seriously

【例】This poster is offensive and degrades women. 这张海报冒失无礼，有辱女性尊严。

【词源】de-，向下；grade，层级。即“降级”。

2）（使）退化，降解；分解

【释】to change or make sth change to a simpler chemical form

【例】It will take at least 100 years for them to degrade naturally. 至少需要100年它们才能自然降解。

3）降低，削弱（尤指质量）

【释】to make sth become worse, especially in quality

【例】Certain irrigation practices degrade soil quality and reduce agricultural productivity. 某些灌溉措施会降低土壤质量，降低农业生产力。

8.eureka moment

突然明白某个道理或找到解决办法的瞬间

相近表达：

aha moment 恍然大悟的时刻

breakthrough 突破

epiphany 顿悟

revelation 启示

9.excrete /ɪkˈskri:t/

v. 排泄

【释】to pass solid or liquid waste matter from the body

【例】To excrete perspiration through the pores of the skin. 通过皮肤上的毛孔排泄汗液。

10.oxidize /ˈɒksɪdaɪz/

v.（使）氧化；（尤指使）生锈

【释】to remove one or more electrons from a substance, or to combine or to make sth combine with oxygen, especially when this causes metal to become covered with rust

【例】Oxidize copper to copper oxide. 使铜氧化变成氧化铜。

【词源】oxide 氧化物 + -ize 使成为、发生

11.aquatic /əˈkwætɪk/

adj.

1）水生的；水栖的

【释】growing or living in, on or near water

【例】aquatic plants/life/ecosystems 水生植物/生物/生态系统

【词源】aqua，水；-tic，形容词后缀

2）水的；水中的；水上的

【释】connected with water

【例】aquatic sports 水上运动

12.pledge /pledʒ/

n. 保证；诺言；誓约

【释】~ (to do sth) a serious promise

【近义】commitment n. 承诺

【例】a pledge of support 支援的许诺

v.

1）保证给予（或做）；正式承诺

【释】~ sth (to sb/sth) to formally promise to give or do sth

【例】The country has pledged $100 million in humanitarian aid. 该国已承诺提供一亿元人道主义援助。

2）使保证；使发誓

【释】~ sb/yourself (to sth) to make sb or yourself formally promise to do sth

【近义】swear v. 郑重承诺，发誓

【例】They were all pledged to secrecy. 他们都宣誓保密。

13.treaty /ˈtriːti/

n.（国家之间的）条约，协定

【释】a formal agreement between two or more countries

【例】to draw up/sign/ratify a treaty 起草/签署/正式批准条约

14.play a role

发挥作用

相似表达：

have an impact

contribute to

play a part

be involved in

have a role

15.critter /ˈkrɪtə(r)/

n. 生物

【释】a living creature

【例】wild critters 野生生物