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Youngpost

Smurf wonders

Fungi may look odd or plain ugly, but they serve vital roles in our lives and the health of forests, writes **Joyee Chan**

During a three-hour stroll in Tai Po Kau last Saturday, Alvin Tang Ming-chak kept his gaze fixed firmly on the damp forest ground. No, he wasn't cautiously watching his footsteps: he knows the way like the back of his hand. Rather, he was keeping an eye out for mushrooms and fungi - and perhaps some Smurfs, too.

Tang is a mycologist, an expert who studies fungi. At one point, he waddled through thick undergrowth on the trailside and called out: "Here is a cluster of tri-colour turkey tails!"

His companions followed to see the finds for themselves: fan-like mushrooms with tree-ring patterns on a fallen log. Nearby were bamboo fungi with graceful tutu-style caps and minuscule bird's nest fungi.

A chef thinks of turning mushrooms into delicious dishes. Scientists like Tang have loftier goals. He says mushrooms can provide answers for some of the world's most pressing problems from global warming to pollution.

There may be as many as 1.5 million species of fungi in all - of which only 10 per cent have so far been identified. Fungi are rooted to the ground like plants, but

belong to their own kingdom of life that includes the red mushrooms that double as Smurfs' little red houses, the mould on old leather, and even fungal infections that turn nails grey and brittle.

The mushrooms we eat are just a small part of it all. And they, too, come in myriad shapes, sizes and colours. Yet it's some of the plain-looking ones that are the most poisonous. A few bites of the European destroying angel

Fungi are vital. They are great recyclers, without which the world cannot function

(*Amanita virosa*) can kill you. But far more often, mushrooms give life. Most fungi may seem ugly, but they play a vital role in ecosystems. Their enzymes help break down fallen trees, withered leaves and even faeces, turning them into new rich nutrients. They are vital for the health of a forest.

Nothing goes to waste in nature, Tang explains. "Fungi are great recyclers, without which the world cannot function," he says.

And that's where they can offer green solutions. The production of

livestock for meat helps fuel global warming. It takes five kilograms of grain to produce a kilogram of beef. "But mushroom needs no artificial feed; waste is all it takes for them to flourish," Tang notes. "The carbon footprint is negative."

Scientists seek to put fungi's powers of decomposing substances to good use in cleaning up pesticides, oil spills and even radiation leakages in what is called bioremediation.

In 2010, scientists studied fenugreek milkcaps (*Lactarius helvus*) in an area of southern Poland that had been greatly affected by the Chernobyl nuclear disaster in 1986. They found the fungi had absorbed radioactive elements well beyond doses that would be deadly to most life forms.

Renowned mycologist Paul Stamets proposed such fungi could help speed up the cleaning of Fukushima, in Japan, by making the area safe for people again after the 2011 nuclear disaster.

Doctors, too, turn to mushrooms for cures to diseases. Some 2,300 species are known to have nutritional and medicinal value. Penicillin, the first antibiotic, came from mushrooms. Shiitake mushroom is known to help fight cancer, while wood ear is a remedy for high cholesterol levels.

Mushrooms, Tang says, are rich in antioxidants, protein, potassium and vitamin B.

"As 90 per cent of the world's fungi await discovery, their potential is huge," he stresses.



Scientists are looking to explore fungi's useful properties. Clockwise from top: cloud mushroom, fluted bird's nest, golden coin-cap, bamboo fungus, tri-colour turkey tails. Photos: Alvin Tang and Joyee Chan

