

Toadstool with teeth and ghostly palm among plant and fungus finds of 2024

Scientists race to discover new species before destruction of natural world drives them to extinction

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Dendrobium wanmae, an orchid found on a remote mountain summit in Indonesia. Photograph: Kew Royal Botanic Gardens

From a toadstool with teeth to a vine smelling of marzipan and a flower that has cheated its way out of having to photosynthesise, a weird and wonderful host of new plant and fungus species have been discovered in 2024.

Other plants given scientific names for the first time include beautiful new orchids, a ghostly palm and a hairy plant that appears to have stolen a gene from an unrelated family. The species are among the 172 new plants and fungi named by scientists from the Royal Botanic Gardens, Kew and their partners.

The species come from every corner of the globe, from woods near Tunbridge Wells in Kent in England, to African sandstone cliffs in Guinea and the forests of Indonesia.



Russula neopascua, a new species of toadstool. Photograph: Kew Royal Botanic Gardens

However, botanists are in a race against time to discover many plants and fungi before the continuing destruction of the natural world drives them to extinction. The loss of species does not only mean that their unique biology is gone forever, but also their potential for use as medicine, food and even as plastic recyclers. Some of the new species in 2024 already face extinction because of cement manufacturing, cinnamon farming and timber plantations.

There are 400,000 named plant species but scientists estimate there are another 100,000 yet to be identified. Every year, scientists name about 2,500 new species of plant and the same number of fungi.



Chlorohiptage vietnamensis grows in a limestone landscape which is being cleared for cement quarries. Photograph: Kew Royal Botanic Gardens

“The sheer privilege of describing a species as new to science is a thrill that not many will ever get to experience,” said Dr Martin Cheek, in RBG Kew’s Africa team. “Sadly, the devastating reality is that more often than not, new species are being found on the brink of extinction and it’s a race against time to find and describe them all.”

About 40% of named plant species are threatened with extinction, as habitats are razed for farmland and other human development, and as many as 75% of the world’s undescribed plant species are thought to be threatened with oblivion.

Toadstools most often have gills or pores under the caps to disperse their spores but those from the genus *Phellodon* have rows of teeth-like protuberances. This

year DNA analysis revealed three new species in the UK, from woodland near Tunbridge Wells and Windsor in England, and Abernethy in Scotland. These fungi are harmed by nitrate pollution from farming and are disappearing across Europe.

Other new fungi include three species of toadstool from the genus *Russula* – which often give off a fishy whiff – from northern Sweden and Norway, the high Rockies in the US and British Columbia in Canada.

Dr Anna Bazzicalupo, a fungi expert at RBG Kew, said: “Identifying new species of fungi is a colossal but increasingly important task as we estimate more than 2m species are waiting to be described. An overwhelming number of them are likely threatened with extinction, meaning they may disappear before they are even recognised.”



Keita deniseae was collected in the Boyboyba forest of Guinea. Photograph: Kew Royal Botanic Gardens

The marzipan-scented liana, a woody, long-stemmed vine named *Keita deniseae* was collected in the Boyboyba forest of Guinea, where the plant climbs into the canopy with strange, hooked structures and bears large, edible fruit.

Three more new lianas were found in southern China. These flower only at night and are pollinated by moths. One, *Cheniella longistaminea*, can grow up to 80 metres tall but all are threatened by plantations of timber and cinnamon, with the latter being a big export to the US. Another new liana in

Vietnam, *Chlorohiptage vietnamensis*, grows in a limestone landscape that is being cleared for cement quarries. Scientists do not know what kind of insect pollinates its strange green flowers.



Cheniella longistaminea, which are pollinated by moths, are threatened by plantations of timber and cinnamon. Photograph: Tiejao Tu/Kew Royal Botanic Gardens

Botanists also revealed a new family of cheats in 2024, called *Afrothismiaceae*. The rare plants, found mostly in forests in Cameroon, do not use sunlight to photosynthesise sugars and have lost their green colour. Plants usually provide

these sugars to mycorrhizal fungi in their roots in exchange for minerals. But the *Afrothismiaceae* species take all they need from their fungal partners, giving nothing in return, and only appear above ground to fruit and flower.

Another rule-breaker is a new herb from Guinea in west Africa, named *Virectaria stellata*, which grows on the remote sandstone cliffs of the Fouta Djallon. It has star-shaped clusters of hair, which have never been seen in this large family before. But these hairy stars do occur in the plants from an unrelated genus called *Barleria*. The botanists think the genes that produce the stellate hairs may have jumped from one family to the other via sap-drinking insects.

Among the most spectacular new species are a bonanza of orchids from Indonesia, which still hosts many unknown species across its 17,000 islands. A climbing palm in western Borneo was also named in 2024, *Plectocomiopsis hantu*. Hantu is the local word for ghost, used because the plant has grey stems and white undersides to its leaves and it is known from only three rainforest locations. Local communities, however, have long used it to make baskets and for its tasty and tender roots.



Plectocomiopsis hantu, a ghost palm, is known in only three rainforest locations. Photograph: Benedikt Kuhnhäuser/Kew Royal Botanic Gardens

Cheek said: “Biodiversity loss is a crisis that affects us all. Every unknown species we lose could have been a potential new food or new medicine that we never even knew existed. We urgently need more funding, training and public awareness of plant and fungal taxonomy.”

‘Bizarre’ blob-headed fish and amphibious mouse among 27 new species found in Peru

By Rosa Rahimi, CNN

3 minute read

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The "blob-headed" fish surprised scientists with its unique, nose-like head. Robinson Olivera/Conservation International

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CNN –

Researchers on an expedition in Peru have discovered 27 animal species new to science – among them a “blob-headed fish” and a type of semi-aquatic mouse. The survey was conducted by Conservation International, an environmental non-profit. It was carried out over a 38-day expedition in 2022 by a team working in the Alto Mayo landscape of northwestern Peru, which covers about 1.9 million acres of forest and agricultural areas and contains a diverse range of ecosystems.

Although the region is densely populated, relatively little has been known about its biodiversity and the health of its ecosystems – with researchers hoping to fill gaps in the data through the survey.

But they were not expecting to unearth so many species new to science: four mammals, eight fish, three amphibians and 10 butterfly species.



Members of the insect team survey a swamp forest using nets and various types of traps. Trond Larsen/Conservation International

When a discovery is considered new to science, it means it has never before gone through the formal scientific process through which new species are given a scientific name.

“We were very surprised to find such high biodiversity in a landscape with so much human influence,” said Trond Larsen, a researcher who led the expedition and directs the Rapid Assessment Program at Conservation International.

Among the most surprising new species was an amphibious mouse with webbed toes – to adapt for life in the water. The group of semi-aquatic rodents to which this mouse belongs is “exceedingly rare” said Larsen, adding that they are “incredibly difficult to find (...) very little is known about the lives of these creatures.”

The researchers found this particular mouse species in just one small patch of swamp forest currently threatened by agricultural practices, making it a high priority for conservation.



The amphibious mouse belongs to a group of semi-aquatic rodents considered among the rarest in the world. Ronald Diaz/Conservation International

The other new mammals the team discovered were a spiny mouse, a short-tailed fruit bat and a dwarf squirrel.

Also described for the first time was the “blob-headed” fish, which gets its name from its enlarged, blob-like head. Fish experts involved with the survey had never seen a feature like this before.

“The blob-headed fish has an incredibly bizarre head that looks almost like a giant swollen nose,” Larsen told CNN. “Scientists have never seen anything like it, and we don’t know what the function of this bizarre blob-like structure is.” One possible theory is that the blob helps the animal detect food, he said – but it “remains a mystery.”

Overall, the survey recorded 2,000 species in the landscape which spans from the Andes to the Amazon and crosses over Indigenous territories, towns and cities. Of those species, 49 are on the International Union for the Conservation of Nature’s Red List – meaning they are at risk of extinction.



Many parts of the Alto Mayo landscape are being cleared for timber and agriculture, leaving behind patches of forest that still maintain important species. Trond Larsen/Conservation International

The researchers hope that knowing more about the region's biodiversity will make it possible to implement effective conservation measures in the face of threats posed by de-forestation and agricultural expansion.

And while the discoveries may have been "new to science," that does not mean they were entirely unknown. The expedition enlisted the help of local indigenous researchers and continues to collaborate with indigenous communities on conservation efforts.



New glowing species discovered in deep sea

"This Rapid Assessment allows the Awajún (indigenous community) to protect our culture, natural resources and our territory, as we have a deep connection with

nature,” said Yulisa Tuwi, an Awajún woman who assisted with the survey’s research on reptiles and amphibians.

“Being part of this research has allowed me to better understand how plants, animals and ecosystems interact with each other, and how this is part of our Awajún cosmovision,” she said in a press release.

“Our main goal is to provide scientific knowledge needed to move conservation forward in a way that works for nature and people,” said Larsen, who added that time is limited to meet global goals for biodiversity conservation.