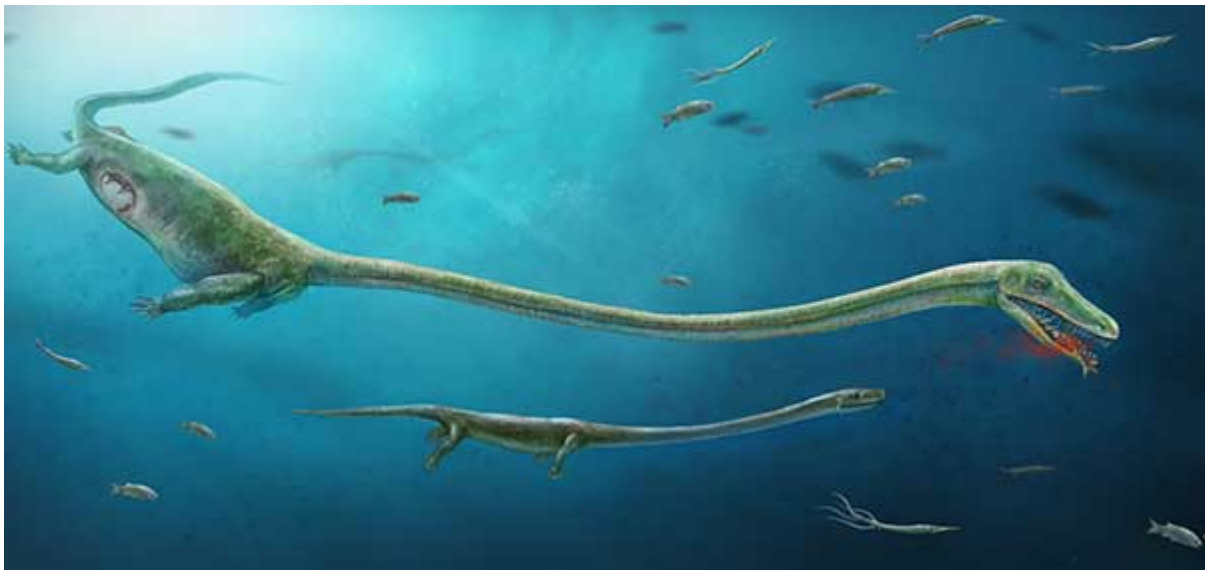
Fossil offers clues to live births



An image released by Nature magazine in February shows a pregnant Dinocephalosaurus catching a fish. [Photo: China Daily]

A fossil of a long-necked marine reptile unearthed in Yunnan province shows the creature that lived millions of years before dinosaurs was developing an embryo, an indicator that it gave birth to live offspring, scientists said on Tuesday.

The discovery at the Luoping Biota National Geopark of the pregnant long-necked marine reptile that lived about 245 million years ago proved the live birth of the unusual fish-eating reptile, known as the Dinocephalosaurus, or terrible-headed lizard, according to research published in the journal Nature Communications.

“Our discovery pushes back evidence of reproductive biology in the group by roughly 50 million years, and shows that there is no fundamental reason to suggest that archosauromorphs, or ruling reptiles, did not give live birth,” said Liu Jun, the lead author of the research and a paleontologist at Hefei University of Technology in Anhui province.

“Evidence of live birth among this category has never been discovered. The findings have changed our understanding of the evolution of vertebrate reproductive systems,” he said.

Liu added that some reptiles – including about 20 percent of the world’s 9,400 species of snakes and lizards – give birth to live young.

The fossil was uncovered along with another 20,000 fossils at the geopark in 2008.

With the help of other researchers, Liu was able to restore the fossil to its original shape and identify the creature in 2011. It is now preserved at the Chengdu Institute of Geology and Mineral Resources.

“I think you’d be amazed to see it, with its tiny head and long snaky neck,” said Mike Benton, a paleontologist a the University of Bristol, who took part in the research.

The species had one of the longest necks relative to body size of any living creature to have existed. It was an estimated 4 meters long, with a slender neck roughly 1.7 meters long, Liu said. It had paddle-like flippers, a small head and a mouth with teeth, including large canines, perfect for snaring fish.

“The identification of the embryo as the reptile’s baby, rather than one of its hearty meals, proved key to the whole research.

“In aquatic amniotes, prey is usually swallowed head first and this orientation is maintained during digestion and disarticulation. Therefore, the neck-forward position of the embryonic skeleton suggests that the included skeleton was not ingested prey, but was an embryo,” the researchers wrote.

“We note that the embryo demonstrates the curled posture typical associated with vertebrate embryos.”

Liu said the fact that the Dinocephalosaurus did not lay eggs has its advantages, as having live births would have been highly adaptive to reproduction in the sea.

“It is also an indicator that marine reptiles practically dominated the oceans at that time,” he added.

Seaplane undergoing final tests

AG-600, the world’s largest amphibious aircraft, will have a maximum takeoff weight of 53.5 metric tons and a size roughly comparable to that of a Boeing 737.[Liang Xun / Xinhua]

The world’s largest amphibious aircraft, the AG-600, will carry out its debut flight in the first half of the year and is due to begin delivery in 2021, its chief designer said.

Huang Lingcai of China Aviation Industry General Aircraft Co, the seaplane’s developer based in Zhuhai, Guangdong province, said on Wednesday that engineers are carrying out final tests on the AG-600 that will conduct the first flight.

Another AG-600 is also undergoing in-house tests in Xi’an, Shaanxi province, he said, adding that 46 out of 53 tests have been completed.

After the tests are completed, pilots will train aboard both aircraft and then practice taxiing before the flight, he said.

“After the maiden flight, we will continue to conduct tests and experiments and finish the certification procedures around 2020. The first deliveries are due in 2021,” Huang said.

China Aviation Industry General Aircraft, a subsidiary of State-owned aircraft giant Aviation Industry Corp of China, launched the AG-600 project in September 2009, aiming to fill China’s lack of amphibious planes.

The Chinese Navy once had a handful of SH-5 maritime patrol amphibious aircraft, but they reportedly have been decommissioned.

Seventeen orders for the new aircraft have been received from Chinese

government departments and domestic enterprises, the company said. An aviation source who did not want to be named said the first user will be the State Forestry Administration.

The company said that the first trial run was made on Monday of the four WJ-6 turboprop engines installed on the AG-600 that will make the first flight.

The seaplane will have a maximum takeoff weight of 53.5 metric tons and a size roughly comparable to that of a Boeing 737. It will be the world's largest amphibious aircraft, surpassing Japan's ShinMaywa US-2 and Russia's Beriev Be-200, Huang said, adding that it will have an operational range of about 4,500 kilometers.

Qu Jingwen, general manager of China Aviation Industry General Aircraft, said the AG-600 will play an important role in forest fire control, maritime search and rescue, transportation of personnel and supplies to islands, and law enforcement tasks at sea.

Huang also said the seaplane can fly a round trip between Sanya, Hainan province, and the shoal of Zengmu Ansha, the southernmost point of China's territory, without refueling.

It is capable of carrying 50 people during a maritime search and rescue mission. To extinguish a forest fire, it can collect 12 metric tons of water from a nearby lake or sea within 20 seconds, information from the company shows.

Wu Peixin, an aviation industry observer in Beijing, said seaplanes such as the AG-600 are suited to maritime search and rescue because they can land on islands and on the surface of the sea, which makes them flexible and gives them a longer operation time compared with ordinary aircraft.

Bike-sharing apps vow to prevent underage users

A girl poses for a photo while sitting in the basket of a bike owned by Mobike, a bike-sharing service provider, at the Bund in Shanghai on New Year's Eve.[Gao Erqiang / China Daily]

The operators of three major bike-sharing apps have pledged to make their services less accessible to children in response to Shanghai traffic and education authorities' calls for improved safety.

China's traffic law bars children under the age of 12 from riding bikes and tricycles on roads, yet a rapid rise in the popularity of shared bikes in cities nationwide has resulted in more young people breaking that law.

After meeting with Shanghai officials on Saturday, operators of Mobike, Ofo and Bluegogo promised to revamp equipment and security procedures to block underage users from accessing their bikes.

"We will replace the mechanical locks on our bikes with smart ones, which will help put an end to illegal use by children," said Ren Baoluan, Ofo's public relations manager.

Netizens have said that Ofo's bikes are easy for children to access because their locks require only a four-digit combination, which some users forget to scramble when they finish their journey, meaning the bikes can then be ridden for free.

Ren said that with smart locks, which Mobike and Bluegogo bikes already have, users are only able to unlock a bike after receiving a dynamic password on their smartphone, and can only end the service once a bike is properly locked.

The companies said they will also jointly assign specialists to patrol key areas such as schools and parks, and cooperate with neighborhood committees to crack down on underage cyclists.

“We will place a warning sign on each of our bikes,” Ren added.

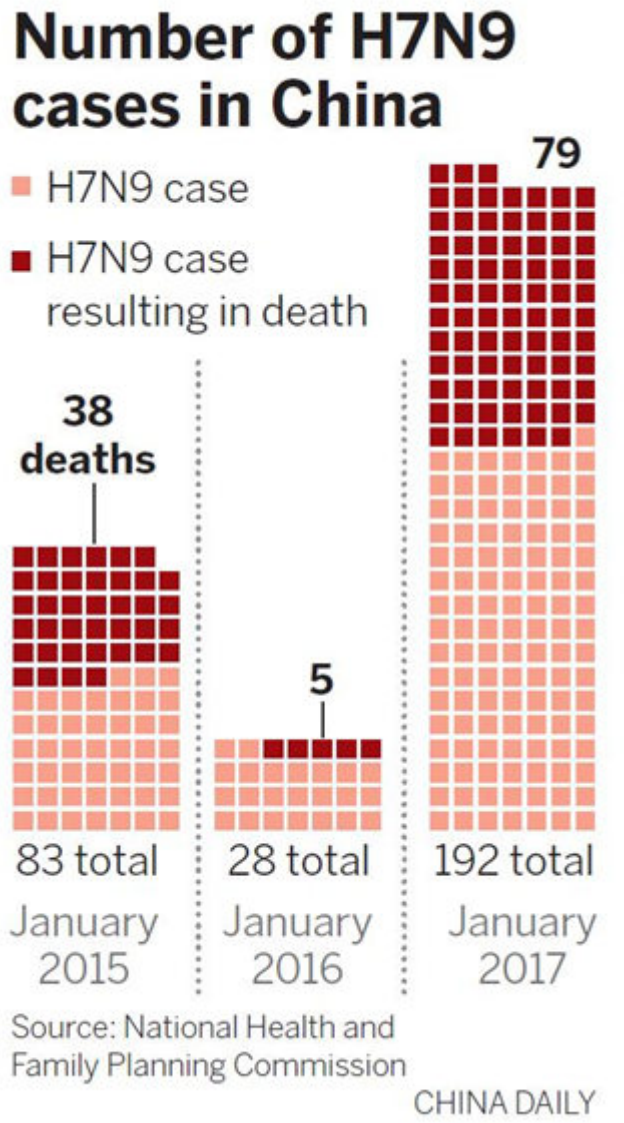
Authorities responded to the issue after receiving complaints that children had been seen racing bikes owned by the apps, which, in some cases, had resulted in injuries.

Statistics from the Shanghai Education Commission show that 245 non-motor-vehicle-related traffic accidents involving children under the age of 12 were reported in the city last year, causing one fatality and 85 injuries.

The total number of shared bikes – which are easy to rent through smartphone apps and can be parked at users’ convenience – in Shanghai, Beijing and Guangzhou has surpassed 100,000.

Cao Guoxing, head of public relations at Mobike, said that while backing efforts to prevent children from riding bikes on the road alone, they encourage children to learn how to cycle when accompanied by adults in a safe space.

H7N9 bird flu season past its peak



China’s worst H7N9 bird flu season appears to have passed its peak but still is expected to last into late April, according to the latest information from epidemiologists.

Ni Daxin, deputy director of emergency response for the Chinese Center for Disease Control and Prevention, said on Wednesday that the H7N9 epidemic appears to have been contained because fewer new cases are being reported daily.

“The peak of the epidemic seems to have passed, but smaller outbreaks may last into late April,” he said at a news conference held by the National Health and Family Planning Commission.

He called for strengthening measures to control the virus, in particular shutting down additional live poultry markets.

In January alone, the Chinese mainland reported 192 human cases of H7N9, including 79 deaths, making it the worst season since the virus first appeared in the country in 2013, according to the commission.

The situation has rekindled public concern about potential viral mutations that could facilitate human-to-human transmission and an H7N9 pandemic.

Shu Yuelong, head of the Chinese National Influenza Center, said the virus has so far shown no mutations that would enable a sustained human spread.

However, he said that there have been four family clusters reported since September, and two may have involved human-to-human transmission via close contact.

Each of the two clusters involved two family members, with the first patient contracting the virus through exposure to live poultry in both cases, Shu said, without providing more details.

“These were highly individual, and all other patients were infected through contact with infected live poultry or wild birds,” he stressed.

China has a national, real-time viral surveillance network and a joint epidemic control force involving several departments covering areas such as agriculture and commerce, according to a division director with the health commission who declined to be named.

“This collaboration is crucial to fighting viruses like H7N9, which can infect birds and humans,” he said. Information exchanges helped agricultural authorities determine that H7N9 contamination is concentrated at live poultry markets, not at chicken farms.

In the hardest-hit regions, almost half of the remaining live poultry markets were found to have H7N9 contamination, he said.

During this H7N9 bird flu season, which started in October, the virus had infected 306 people and by the end of January had killed 100 in 16 provinces, including Guangdong, Jiangsu and Anhui.

Most cases happened in the south and on the eastern seaboard, Ni said, adding that the main reasons were weather conditions and “the local habits of buying live or freshly slaughtered chickens”.

In response, regions have shut down live poultry trading and markets as part of effort to contain the outbreak.

But that is only a short-term, emergency measure, Ni said. “The ultimate way out is to upgrade the industry, shifting to large-scale poultry farming and slaughtering.”

The closing of live poultry markets has proved effective in slowing the spread of the virus, he said, adding that the public can also help by avoiding live poultry markets or handling live poultry or their droppings.

“If the public buys only frozen poultry, control of the epidemic will be much easier. The nutritional value is equal to that of freshly slaughtered poultry, but it involves far fewer health risks,” Ni added.

Beijing to invest US$40 billion in key projects in 2017

The city of Beijing plans to invest 274.4 billion yuan (about US$40 billion) in a total of 230 key projects in 2017, an increase of 20 projects from the year earlier.

The fixed-asset investment of the municipal government will reach 55 billion yuan in 2017, a year-on-year increase of 6.5 percent. Apart from the government, other kinds of investment will also be used, including PPP (public-privation partnership), capital investment and investment in funds.

A total of 274.4 billion yuan will be invested in 230 key projects in 2017, which will contribute more than 30 percent of the overall investment. Investment will focus on basic education, the aged care, renovation of the city's shantytown, air pollution, traffic congestion, water quality, garbage disposal and other areas that the public is most concerned.

Beijing's transportation will involve 19 key projects, the shantytown renovation projects 11 projects, the public service 14 projects. And the coordinated development of the Beijing-Tianjin-Hebei region will carry out 62 projects. Beijing also plans to invest 38.4 billion yuan in 61 infrastructure projects this year, including the first phase of the new airport line and other 21 rail transit projects.