What if you share a drink with a bat?

Introduction

Bats have a really bad reputation - undeserved one. Maybe you have heard some horrifying stories like blood-sucking and hair tangling. They are not true, by the way! Bats are in fact important for our environment - they keep insect populations in check and some of them are important pollinators (like bees).

One thing, though, that makes bats look bad is that sometimes, not often, they spread diseases. Unfortunately, pretty deadly ones. These include the scary Ebola and Marburg diseases, SARS (Severe Acute Respiratory Syndrome) and Nipah virus infections which cause encephalitis - an inflammation of the brain.

Scientists discovered the Nipah virus recently (in 1999) in Malaysia, in a farming village called Nipah (this is how the virus got its name). It turned out that people built their pig farms too close to bat-inhabited forests. The virus jumped from the bats, which are its natural reservoir, to the pigs, then from pigs to humans. Many people got sick and more than half of them died. (Read more in How one man saved his country from a nightmare virus called Nipah.)

In the past few years, there were some new Nipah cases in Bangladesh which had an unknown source. Had the virus found yet another way to infect people?

We found that eight of them drank fermented palm sap - the local palm wine. We believe that drinking this liquor is a potential way to get infected with Nipah virus. Palm wine producers should probably take measures to prevent contact between bats and the sap.

Abstract

We discuss it with you before we create it and we offer you two different ones to pick from. You can suggest further changes to the one you pick.

JUNE 2017

Total text length: 800-1000 words for the main text (excluding glossary, references, assessment questions) so that the entire adaptation will fit on 4 pages

Title: an open question that is short and catchy (ideally no more than 40 characters), not a yes/no question. It can be the original research question as long as phrased appropriately.

Authors: researchers from the original paper in order of your choice.

Associate editors: members of our team who worked on the adaptation.

More free environmental science resources at: www.ScienceJournalForKids.org

Figure 1: Indian Flying Fox bat (Pteropus giganteus)
SPECIFICATIONS GUIDE

Methods

Our epidemiological study took place in two districts in Bangladesh from 2011 to 2014. We took a few steps and some detective work to find a possible route of infection.

- We identified possible cases of Nipah virus infections. Sometimes, diagnosis is not that easy. So we categorized the possible cases as:
  - Suspected: no lab diagnosis but the symptoms were present (fever, altered mental status, seizures);
  - In Febrile: the patient had exhibited the described symptoms and had lived near a patient with confirmed Nipah virus infection but had died before we could take a sample;
  - Confirmed: the symptoms were present and we found antibodies against the virus.

We also noted if the patient had had contact with another Nipah-infected patient. In this case we are talking about a secondary infection. When there has been no such contact we talk about primary infection.

- We identified clusters of Nipah virus infection - at least two people with brain inflammation living near each other.
- We identified probable route of infection. We talked to the surviving patients or the friends of the deceased ones. Had they been drinking raw palm sap? Had they had contact with sick pigs or other animals? We limited this study to clusters where these answers were no. It turned out that some of them had drunk wine, called tari, prepared from fermented palm sap, so we investigated its production as well.

Results

We focused on three clusters where the virus source was unknown. Within them, there were 14 cases of sick people described in figure 2.

Eight of the patients had drunk tari before their illness began. Another six had close contact with them (for example, they took care of the sick) and then got sick themselves.

It seemed quite possible that the tari was somehow involved, so we asked around how it was made. The process resembles the process of collecting raw palm sap: the harvesters cut the old leaves at the top of the palm tree and insert a bamboo spigot (tap). (See Fig. 3 and the video.) Then they hang a pot under the spigot and wait. The collected sap ferments for several days in the pot. This is a mistake – the longer the pots stay there exposed, the more opportunities for bats to contaminate them. Indeed, the harvesters had found bat excreta in and on the sap pots.

Results: 50-150 words.

We adapt one of the results graphs from the original paper. Compare this adaptation to the original graph.

Numbers or bullet lists make the text easier to digest.

We highlight key points in the research to draw students’ attention.
We try to use as little technical terminology as possible. You might not realize that everyday terms that sound simple to you, are not so simple to a kid. (E.g. compound terms such as "plant community flowering patterns" etc).

If a term is essential to your research, we introduce it in the text and define it in the glossary. But we try to limit these to the truly essential ones.

Ultimately, the adaptation will sound very different from the original paper - this is the point! In many cases it may initially sound too simple. But we recommend you trust our editors as they have extensive experience communicating with children and can judge when a text or image is too complex for the intended reading level.
REFERENCES


National Public Radio reports:

• The fascinating story of how Nipah was first discovered: How one man saved his country from a nightmare virus called Nipah

• Disease detectives find a really good reason not to drink date palm wine
  http://www.npr.org/sections/goatsandsoda/2016/03/12/470803523/disease-detectives-find-a-really-good-reason-not-to-drink-date-palm-wine

Check your understanding

1. Nipah virus is related to measles, mumps and paramyxoviruses. There is something really alarming about that. So alarming that a lot of governments donated a total of 460 million dollars for the fast development of a vaccine against Nipah virus. What is it?

2. Bats are mammals like us. Do you have any ideas why they don’t get sick from the viruses they carry?

3. Are bats and the viruses they carry in a mutualistic relationship?

4. Why are bats an important part of our environment?

5. What should you do if you discover a bat in your house or fallen on the ground?