



# *Candida auris*. A globally emerging multidrug-resistant yeast

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# First report from Japan in 2009

## ***Candida auris* sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital**

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## South Korea 2009 and 2011

- **2009 report on 15 ear infection in patients at 5 hospitals**
  - Isolates from 2004–2006
- **2011 report of 3 *C. auris* blood stream infections in 1 hospital**
  - Isolates from 1996 and 2009
  - First report of invasive *C. auris* infection



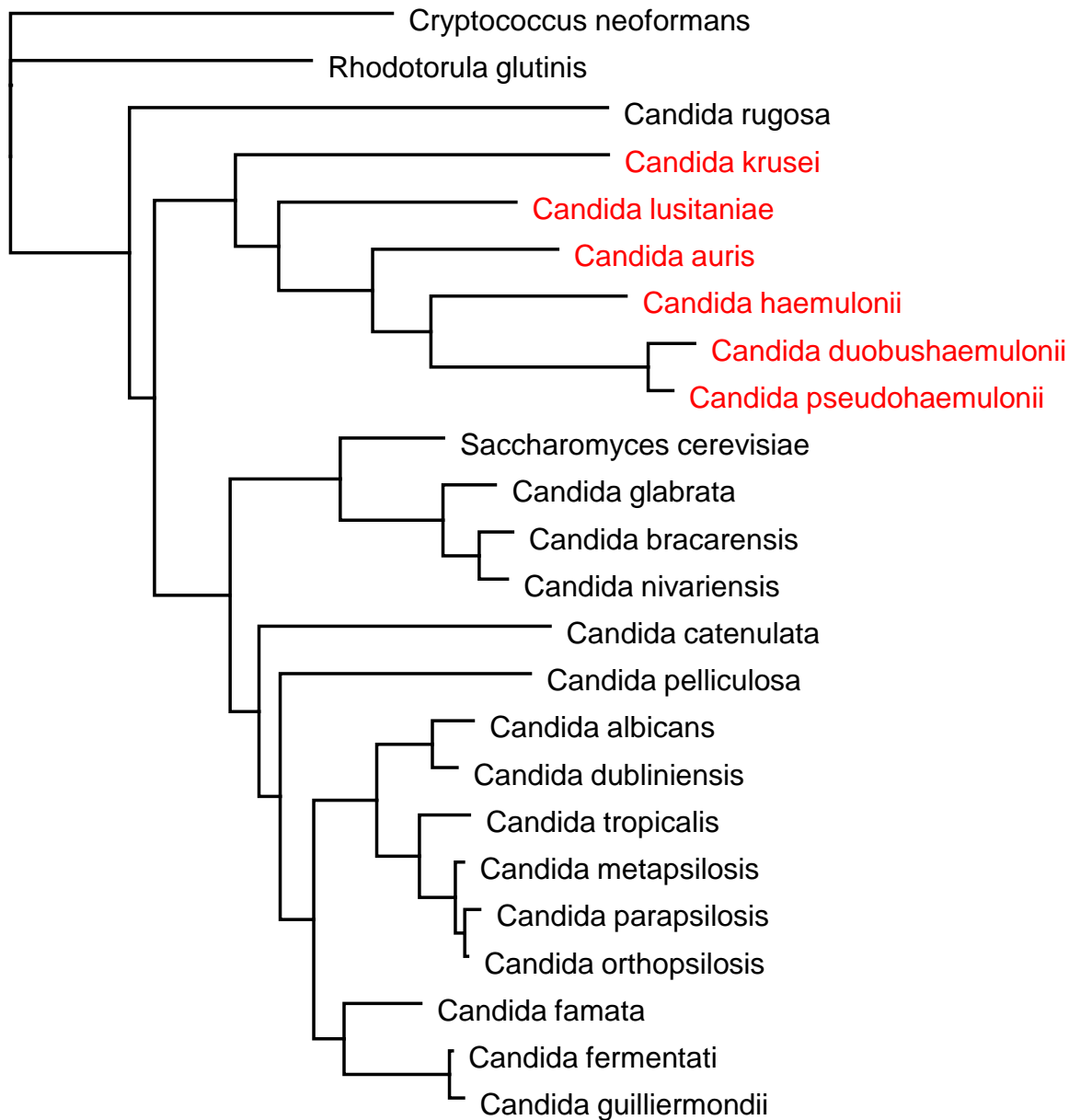
## India 2011

- **2011 report of 12 BSIs from 2 Delhi hospitals**
  - Isolates collected 2009–2011
- **2015 report of ICU associated candidemia in India: *C. auris* in 19 Indian ICUs**
  - Isolates collected 2011–2012



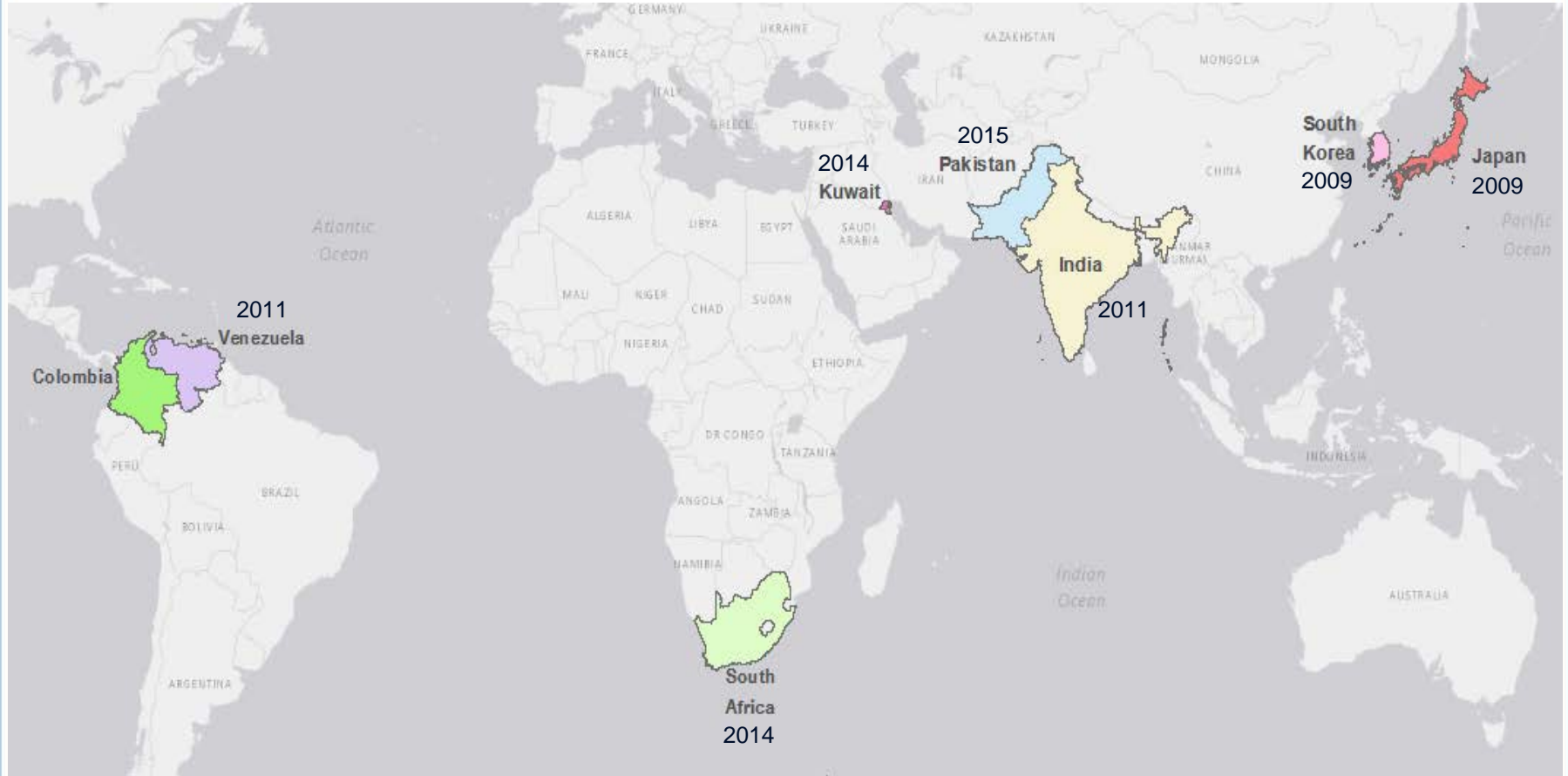
## ***C. auris* basics**

- **Causes invasive infections, predominantly fungemia**
- **Multidrug resistant**
  - 93% resistant to fluconazole; 54% resistant to voriconazole
  - 35% resistant to amphotericin B
  - 7% resistant to echinocandins
  - **4% resistant to azoles, amphotericin B, AND echinocandins**
- **Requires molecular methods to distinguish from other *Candida* species**
  - Phenotypically similar to *C. haemulonii*

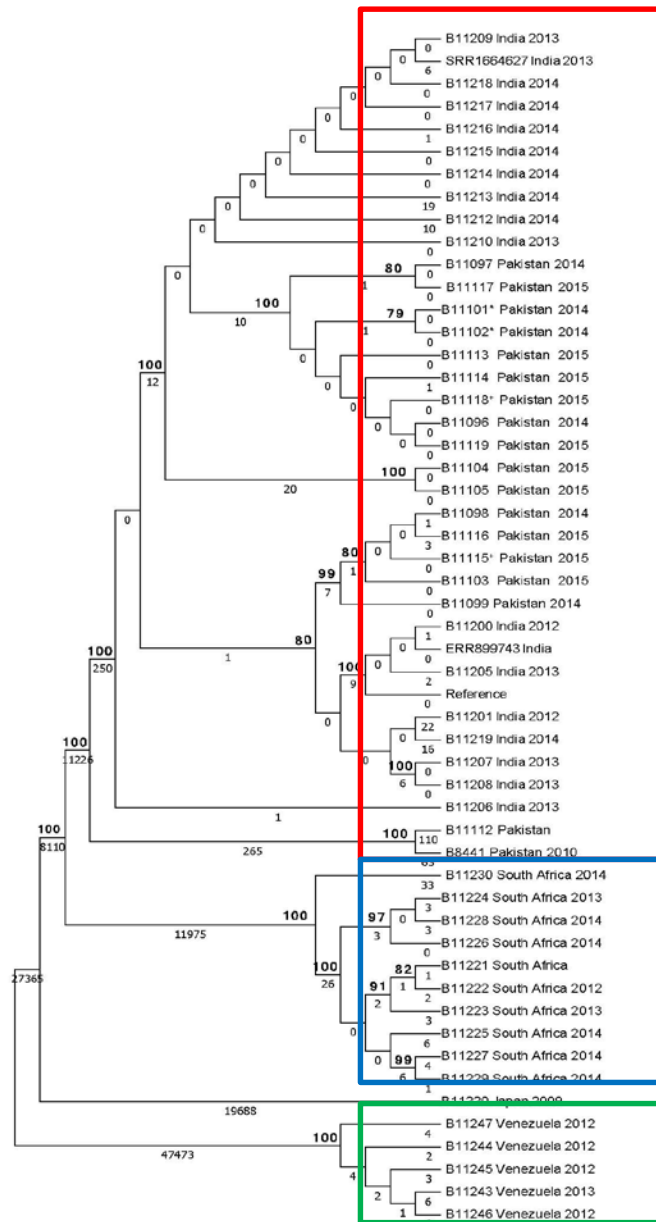


Antifungal  
resistant  
clade

# Global emergence during 2009–2015



# WGS suggests simultaneous, independent emergence



India/Pakistan

South Africa

Japan

Venezuela



## ***C. auris* epidemiology**

- **Patients of all age ranges (NICU infants → elderly)**
- **Similar risk factors as for other *Candida* spp.**
  - Diabetes
  - Antibiotic use
  - Recent surgery
  - Presence of a central venous catheter
- **Sometimes occurs in conjunction with other *Candida* spp**
- **Many patients on antifungal treatment when *C. auris* isolated**
- **Median time from admission to infections: 17 days**
- **Mortality ~60%;**
  - 100% in Venezuela in NICU infants

## UK 2015-2016 outbreak

- **An adult critical care unit in the UK with 40 patients either colonized or infected with *C. auris***
  - ~20% of these patients had candidemia
- **Outbreak difficult to control despite intensive IC efforts:**
  - regular patient screening
  - environmental decontamination
  - ward closure

## Why are we concerned about *C. auris*?

- **Multi-drug resistant**
  - Some isolates resistant to all three major antifungal classes
- **Can be misidentified**
  - Usually misidentified as other *Candida* spp or *Saccharomyces*, when using biochemical methods (API strips or VITEK-2)
  - MALDI-TOF can detect *C. auris*
    - Not all MALDI-TOF manufacturers include *C. auris* in their reference database
- **Has caused outbreaks in healthcare settings**
  - Unlike other *Candida* spp., seems to colonize healthcare environments
  - Major infection control challenges

# CDC issued a clinical alert to healthcare facilities – June 2016

## Fungal Diseases

Fungal Diseases	
Types of Fungal Diseases	-
Aspergillosis	+
Blastomycosis	+
Candidiasis	-
Oropharyngeal / Esophageal Candidiasis	
Genital / vulvovaginal candidiasis	
Invasive candidiasis	
<i>Candida auris</i> Q&A	
<b><i>Candida auris</i> Alert</b>	
Coccidioidomycosis	+
<i>C. neoformans</i> Infection	+
<i>C. gattii</i> Infection	+
Fungal Eye Infections	+

[CDC](#) > [Fungal Diseases](#) > [Types of Fungal Diseases](#) > [Candidiasis](#)

### Clinical Alert to U.S. Healthcare Facilities



### Global Emergence of Invasive Infections Caused by the Multidrug-Resistant Yeast *Candida auris*

**Summary:** The Centers for Disease Control and Prevention (CDC) has received reports from international healthcare facilities that *Candida auris*, an emerging multidrug-resistant (MDR) yeast, is causing invasive healthcare-associated infections with high mortality. Some strains of *C. auris* have elevated minimum inhibitory concentrations (MICs) to the three major classes of antifungals, severely limiting treatment options. *C. auris* requires specialized methods for identification and could be misidentified as another yeast when relying on traditional biochemical methods. CDC is aware of one isolate of *C. auris* that was detected in the United States in 2013 as part of ongoing surveillance. Experience outside the United States suggests that *C. auris* has high potential to cause outbreaks in healthcare facilities. Given the occurrence of *C. auris* in nine countries on four continents since 2009, CDC is alerting U.S. healthcare facilities to be on the lookout for *C. auris* in patients.

#### Background

*Candida auris* is an emerging multidrug-resistant (MDR) yeast that can cause invasive infections and is associated with high mortality. It was first described in 2009 after being isolated from external ear discharge of a patient in Japan<sup>1</sup>. Since the 2009 report, *C. auris* infections, specifically fungemia, have been reported from South Korea<sup>2</sup>, India<sup>3</sup>, South Africa<sup>4</sup>, and Kuwait<sup>5</sup>. Although published reports are not available, *C. auris* has also been identified in Colombia, Venezuela, Pakistan, and the United Kingdom.

It is unknown why *C. auris* has recently emerged in so many different locations. Molecular typing of strains performed by CDC suggests isolates are highly related within a country, suggesting but highly distinct between continents<sup>6</sup>. The earliest known infection with *C. auris* based on retrospective testing of

# Public Health England released an alert in June/July 2016

 **GOV.UK**

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Public Health  
England

[See more information about this Research and analysis](#)

Research and analysis

## **Candida auris identified in England**

Published 1 July 2016

## **Public Health Agency of Canada also released an alert in July 2016**

**PHAC Communication Re: Emerging global HAI-AMR issue –  
*Candida auris***

**PHAC has recently learned of a public health alert from US CDC in relation to the global emergence of invasive infections caused by the Multidrug-Resistant yeast organism, *Candida auris*.**

## **Infection Control Recommendations**

- **Report to CDC and state and local health departments**
- **Standard and Contact Precautions**
- **Single room**
- **Daily and terminal cleans to reduce environmental burden of organisms with EPA registered disinfectant**

**\*UK guidelines recommend “screening patients at risk for candidemia”**

## Action Steps

- **Case finding domestically**
  - Clinical alert, highlighting in SHEA newsletter and other avenues
  - EIP surveillance
  - Antibiotic resistance laboratory network
- **Developed preliminary plan for outbreak response in the US**
- **Working with EPA and FDA to understand what works for disinfection**
- **International partnerships to study unanswered questions while maintaining vigilance for infection in the U.S.**



# Questions

- **Why is this species emerging now?**
  - has it been here all along and we just misidentified it?
  - why is it emerging in so many places simultaneously?
- **What are risk factors for this infection?**
- **Why do some infections lead to outbreaks while others are sporadic cases?**
- **How do we control the spread of this infection?**