Algorithm to identify *Candida auris* based on biochemical laboratory method and initial species identification

**PURPOSE**

*Candida auris* is a multidrug-resistant yeast that has been found in multiple countries, including the United States. *C. auris* can cause invasive infections, be passed from person to person, and persist in the environment. Its severity, communicability, and drug resistance makes correctly identifying *C. auris* crucial to treating patients and preventing infections. However, this is challenging because traditional biochemical methods frequently misidentify *C. auris*. This algorithm details the steps needed to determine the correct *Candida* spp. based on the tests and equipment available in your lab.

**TABLE OF CONTENTS – ALGORITHMS BY METHOD**

1. Bruker Biotyper MALDI-TOF  
2. bioMérieux VITEK MS MALDI-TOF  
3. VITEK 2 YST  
4. API 20C  
5. BD Phoenix  
6. MicroScan  
7. RapID Yeast Plus  
8. Summary of this algorithm in table form

*Please note that these algorithms are based on our current knowledge about misidentification of *C*.auris and may change as we learn new information.*
**C. auris confirmed:**
Place patient in transmission-based precautions, report to CDC (candidaauris@cdc.gov), and notify state and local health departments.

**C. auris possible:**
Further work-up needed to determine if actually *C. auris*. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).
bioMérieux VITEK MS
MALDI-TOF

RUO library

- C. auris
  - C. auris confirmed
- C. haemulonii
  - C. haemulonii
  - No identification
- No identification

IVD library

- C. haemulonii
  - C. haemulonii
  - No identification
- No identification

C. auris confirmed:
Place patient in transmission-based precautions, report to CDC (candidaauris@cdc.gov), and notify state and local health departments.

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Further work-up needed to determine if actually C. auris. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).
**C. auris confirmed:**
Place patient in transmission-based precautions, report to CDC (candidaauris@cdc.gov), and notify state and local health departments.

**C. auris possible:**
Further work-up needed to determine if actually *C. auris*. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).
Identification Method

API 20C

- Rhodotorula glutinis
  - Characteristic red color present?
    - No: C. auris possible: Needs further work-up
    - Yes: Likely not C. auris
- C. sake
  - C. auris possible: Needs further work-up
- Candida spp. not identified
  - C. auris possible: Needs further work-up

Next steps

C. auris suspected:
Place patient in transmission-based precautions and notify state and local health departments and CDC (candidauris@cdc.gov). Send any isolates suspected to be C. auris to a reference lab, a state public health lab, a regional lab, or CDC for further identification.

Likely not C. auris:
No further C. auris-related action required.
**Identification Method**

- **BD Phoenix**

**Initial finding**

- **C. catenulata**
- **C. haemulonii**
- **Candida spp. not identified**

**Determination**

- **C. auris possible:** Needs further work-up
- **C. auris possible:** Needs further work-up
- **C. auris possible:** Needs further work-up

**Next steps**

**C. auris possible:**
Further work-up needed to determine if actually *C. auris*. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).
**Identification Method**

**MicroScan**

- **C. lusitaniae**
- **C. guilliermondii**
- **C. parapsilosis**
- **C. famata**
- **Candida spp. not identified**

**Initial finding**

- **Test using cornmeal agar**

  - **No hyphae or pseudohyphae present**
    - Can rule-out *C. lusitaniae*, *C. guilliermondii*, and *C. parapsilosis*. *C. auris* possible: Needs further work-up
  
  - **Hyphae or pseudohyphae present**
    - Likely to be *C. lusitaniae*, *C. guilliermondii*, or *C. parapsilosis*, but cannot rule-out *C. auris*. Some *C. auris* strains have had hyphae or pseudohyphae, so consider further work-up

**Determination**

- **C. auris** possible: Needs further work-up

**Next steps**

- **C. auris** possible: Further work-up needed to determine if actually *C. auris*. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidauris@cdc.gov).
**RapID Yeast Plus**

- **C. parapsilosis**
  - Test using cornmeal agar
  - No hyphae or pseudohyphae present
    - Can rule-out *C. parapsilosis*. *C. auris* possible: Needs further work-up
  - Hyphae or pseudohyphae present
    - Likely to be *C. parapsilosis*, but cannot rule-out *C. auris*. Some *C. auris* strains have had hyphae or pseudohyphae, so consider further work-up

- **Candida spp. not identified**
  - *C. auris* possible: Needs further work-up

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**Next steps**

*C. auris* possible:
Further work-up needed to determine if actually *C. auris*. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).
<table>
<thead>
<tr>
<th>Identification Method</th>
<th>Database/Software, if applicable</th>
<th>C. auris is confirmed if initial identification is C. auris.</th>
<th>C. auris is possible if the following initial identifications are given. Further work-up is needed to determine if the isolate is C. auris.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruker Biotyper MALDI-TOF</td>
<td>Research use only (RUO) library</td>
<td>C. auris</td>
<td>No identification</td>
</tr>
<tr>
<td></td>
<td>FDA library</td>
<td>C. auris</td>
<td>No identification</td>
</tr>
<tr>
<td>bioMérieux VITEK MS MALDI-TOF</td>
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<td>C. haemulonii No identification</td>
</tr>
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<td></td>
<td>C. parapsilosis* Candida spp. not identified</td>
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</tbody>
</table>

* C. guilliermondii, C. lusitaniae, and C. parapsilosis generally make hyphae or pseudohyphae on cornmeal agar. If hyphae or pseudohyphae are not present on cornmeal agar, the isolate should raise suspicions of being C. auris as C. auris typically does not make hyphae or pseudohyphae. However, some C. auris isolates have formed hyphae or pseudohyphae. Therefore, it would be prudent to consider any C. guilliermondii, C. lusitaniae, and C. parapsilosis isolates identified on MicroScan and any C. parapsilosis isolates identified on RapID Yeast Plus as possible C. auris isolates and further work-up should be considered.

If C. auris is confirmed: Place patient in transmission-based precautions, report to CDC (candidaauris@cdc.gov), and notify state and local health departments.

If C. auris is possible: Further work-up is needed to determine if actually C. auris. Send isolates to a reference lab, a state public health lab, a regional lab, or CDC for further identification. Place patient in transmission-based precautions and notify state and local health departments and CDC (candidaauris@cdc.gov).