Evaluation of a Novel Chromogenic Agar for *Candida auris* Screening

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REVISED ABSTRACT

Candida auris is an emerging multidrug-resistant yeast with the propensity to spread in the healthcare setting. *C. auris* can cause invasive infections, spread person-to-person, and persist in the healthcare environment causing healthcare-associated outbreaks. The accurate and rapid identification of *C. auris* is important to provide adequate therapy and appropriate infection control measures to contain its spread. CDC recommends screening for *C. auris* colonization in patients who are at high risk. However, identification of *C. auris* from screening cultures is challenging.

BBL CHROMagar Candida is a chromogenic agar that is used widely in clinical microbiology laboratories mainly for the identification of *C. albicans*, *C. tropicalis*, and *C. krusei* due to their distinctive appearance. *C. auris* does not have a characteristic colony appearance on this media, thus requiring additional testing. Recently, a selective and differential chromogenic agar, HardyCHROM Candida+auris agar, has been developed to assist clinical laboratories in directly identifying *C. auris* based on its teal-green color with a bullseye appearance and fluorescence at 365 nm.

In this study we compared Hardy to BBL agar for the isolation and identification of *C. auris* using 75 specimens (26 nares, 26 axilla/groin, and 23 perirectal) from 26 patients submitted for *C. auris* screening. Plates were incubated at 35-37°C and read at 48-72 h. White or teal-green colonies with bullseye centers on Hardy agar and white to light pink colonies on BBL agar were further identified by MALDI–TOF (VITEK MS v3.2).

A positive result was considered as any isolate with a typical colony on Hardy agar or white to light pink on BBL agar that was confirmed to be *C. auris* by MALDI–TOF. *C. auris* was isolated from 19 patients and 45% (34/75) of the specimens. A total of 29 samples from 18 patients were positive for *C. auris* by both media (13 nares, 5 perirectal and 11 axilla/groin) and 41 samples were negative by both media. An additional 4 samples grew a few (< 20) colonies of *C. auris* only on Hardy agar (3 axilla/groin and 1 perirectal) and 1 sample grew a few colonies of *C. auris* on BBL agar.

In summary, Hardy agar for the direct identification of *C. auris* based on typical color/morphology and fluorescence had one false negative specimen showing a sensitivity of 97.1% (33/34). BBL agar had four false negative specimens showing a sensitivity of 88.2% (30/34). The distinctive features of *C. auris* grown on Hardy agar showed this media to be a helpful tool to screen for *C. auris*.

PURPOSE

To compare HardyCHROM Candida+auris agar to BBL CHROMagar Candida for the detection of *Candida auris* from screening cultures.

STUDY DESIGN

75 Screening swabs from 26 patients
26 Nares , 26 Axilla/groin, 23 Perirectal

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Plate on HardyCHROM Candida+auris agar &
BBL CHROMagar Candida

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Incubate plates at 35-37°C, non-CO_2

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Read at 48-72 hours

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Evaluate colonies

Hardy agar:
White or teal-green with bullseye center
and/or fluorescence at 365 nm

BBL agar:
White to light pink

↓

Identify by MALDI–TOF (VITEK MS v.3.2)

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Colonies identified by MALDI–TOF as *C. auris* considered positive

RESULTS

Comparison of HardyCHROM Candida+auris and BBL CHROMagar Candida

	Nares			Axilla/groin			Perirectal	
Patient	BBL	Hardy		BBL	Hardy		BBL	Hardy
1	0	0		3+	2+		3+	2+
2	2+	1+		0	0		0	0
3	0	0		0	0		0	0
4	2+	2+		Few	Few		0	0
5	0	0		2+	2+		Few	Few
6	0	0		0*	Few		0	0
7	0	0		0	0		0	0
8	3+	2+		0	0		0	0
9	0	0		0	0		0	0
10	1+	1+		4+	4+		0	0
11	0	0		1+	1+		Few	Few
12	4+	4+		0	0		0	0
13	0	0		2+	2+		0	Few
14	4+	4+		Few	0		0	0
15	4+	4+		Few	Few		0	0
16	3+	3+		1+	1+		Few	Few
17	3+	3+		0	Few		0	0
18	2+	2+		1+	1+		0	0
19	2+	2+		Few	Few		0	0
20	3+	3+		0	0		0	0
21	Few	Few		0	Few		1+	1+
22	0	0		0	0		0	0
23	0	0		0	0		0	0
24	0	0		0	0		-	-
25	0	0		3+	3+		-	-
26	0	0		0	0		-	-
Total positives	13	13		12	14		5	6

*(see below) The culture was mixed with *C. parapsilosis*, BBL agar was initially called negative. *C. auris* was found upon further investigation after the Hardy agar was positive.

Patient 6 Axilla/groin

Hardy BBL

	Positive Hardy	Negative Hardy
Positive BBL	29	1
Negative BBL	4	41

Total specimens: 75
Positive specimens: 34

Sensitivity
Hardy: 97.1% (33/34)
BBL: 88.2% (30/34)

Differentiation of *C. auris* vs. *C. parapsilosis*

- Indistinguishable on BBL agar
- Distinct colonies on Hardy agar

C. auris – teal-green
C. parapsilosis – white

Mixed culture with *C. auris* and *C. parapsilosis*

Hardy BBL

CONCLUSION & DISCUSSION

- 34/75 specimens from 19 patients were confirmed by MALDI–TOF to be positive for *C. auris*
- Hardy agar had a sensitivity of 97.1% (33/34)
- BBL agar had a sensitivity of 88.2% (30/34)
- Fluorescence on the Hardy agar was generally found with younger colonies which were still white 48 h. The development of the teal-green color tended to mask the fluorescence at 72 h.
- The distinctive features of *C. auris* grown on the Hardy agar showed this media to be a helpful tool to screen for *C. auris*.

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