HEALTH-FRI-240

Optimizing *Candida auris* Surveillance: Direct Chromogenic Plating and MALDI-TOF Identification Outperform Broth Enrichment for Rapid, Accurate Detection

brownl@dynacare.ca

Leah A. Brown[1], Lisa Rosenberg[2], Dr. Lee W. Goneau[1]

[1]Dynacare Laboratories, Brampton, ON, Canada, [2]Dynacare Laboratories, Ottawa, ON, Canada

Introduction

Candida auris is an emerging multidrug-resistant yeast and an increasing public health concern in Canada. Designated by the World Health Organization as a "critical priority pathogen," *C. auris* causes severe invasive infections associated with high morbidity and mortality among hospitalized and immunocompromised patients. Its persistence on environmental surfaces, resistance to disinfectants, and frequent misidentification by routine laboratory systems complicate infection prevention and control efforts, emphasizing the need for rapid presumptive identification from screening and clinical specimens.

Objective

To evaluate culture media, enrichment, and identification platforms to optimize workflows for presumptive *Candida auris* surveillance in clinical laboratories.

Methods

Media Evaluation

- Three media were evaluated for presumptive identification of *Candida auris*:
  - OXOID Sabouraud Dextrose Agar (SA)
  - OXOID Brilliance Candida Agar (BC)
  - CHROMagar COLOREX Candida Plus (CP)

Figure 1. Left to right: SA, BC, CP

Isolates & Inoculation

- Twenty-one yeast isolates were evaluated (Table 1)
- Each isolate was suspended to a 0.5 McFarland standard
- Suspensions were inoculated:
  - Directly into M40 swabs, or
  - Into OXOID Auris Enrichment Broth
- Final inoculum concentration: ~1 × 10^6 CFU/mL

Enrichment & Incubation

- Auris Enrichment Broth incubated at 35–37° C and monitored for turbidity
- Following visible growth, subcultures were plated onto BC, SA, and CP media
- All agar media incubated at 30–35° C for up to 48 h

Organism Identification

- Colony growth and morphology were assessed on each medium
- Isolates identified using:
  - VITEK® 2 (v9.04, YST card)
  - VITEK® MS (v3.3)

Methods

Table 1. Study Isolates

Sample ID	Organism Source	Organism Name
1 - 10	PHOL	*Candida auris*
11 - 15	PHOL	*Candida haemulonii*
16 - 18	PHOL	*Candida duobushaemulonii)*
19	IQMH	*Candida duobushaemulonii*
20	CAP	*Candida albicans*
21	ATCC	*Candida albicans*

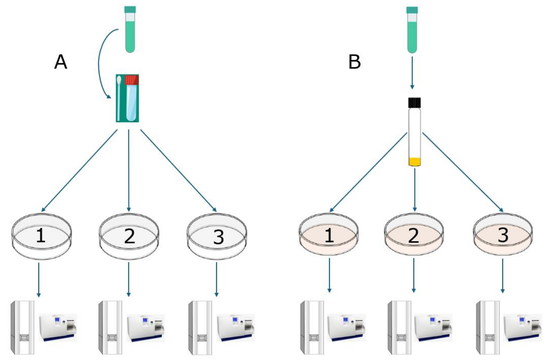

Figure 2. Workflow for testing 21 yeast isolates without (A) and with (B) Auris Enrichment Broth.

Results

Table 2. Comparison of Culture Growth With and Without Auris Enrichment Broth

ID	Without Enrichment Broth						With Enrichment Broth					
	CP Day1	CP Day 2	BC Day 1	BC Day 2	SA Day 1	SA Day 2	CP Day 1	CP Day 2	BC Day 1	BC Day 2	SA Day 1	SA Day 2
1	1+	3+	NG	1+	NG	1+	4+	4+	OCC	1+	4+	4+
2	HAZE	2+	NG	1+	NG	1+	4+	4+	OCC	4+	3+	4+
3	1+	1+	NG	1+	NG	1+	4+	4+	NG	4+	3+	4+
4	1-2+	3+	NG	1+	NG	1+	3+	3+	OCC	4+	1-2+	4+
5	1-2+	2+	NG	HAZE	NG	1+	4+	4+	NG	3+	4+	4+
6	1+	2+	NG	1+	NG	2+	4+	4+	1+	4+	4+	4+
7	2+	3+	NG	1+	NG	1+	4+	4+	OCC	4+	4+	4+
8	2+	3+	NG	1+	4+	4+	NG	NG	NG	NG	NG	NG
9	1+	3+	NG	1+	OCC	2+	4+	4+	1+	4+	4+	4+
10	2+	3+	NG	1+	NG	1+	4+	4+	1+	4+	4+	3- 4+
11	NG	2+	NG	NG	NG	1-2+	4+	4+	NG	NG	1-2+	4+
12	NG	2+	NG	NG	OCC	3+	4+	4+	NG	NG	OCC	4+
13	NG	2-3+	NG	NG	NG	2+	4+	4+	NG	NG	OCC	4+
14	NG	3+	NG	NG	NG	2+	4+	4+	NG	NG	2+	4+
15	NG	4+	NG	NG	NG	2+	4+	4+	NG	NG	OCC	4+
16	NG	OCC	NG	NG	NG	2+	NG	3+	NG	NG	NG	4+
17	NG	4+	NG	NG	NG	1+	OCC	4+	NG	NG	NG	4+
18	1+	2+	NG	NG	NG	2+	4+	4+	NG	NG	NG	4+
19	NG	4+	NG	NG	NG	2+	4+	4+	NG	NG	2+	4+
20	1+	3+	1+	3+	1+	2+	1+	1+	HAZE	2+	OCC	3+
21	1+	2+	1+	4+	1+	3+	OCC	OCC	NG	OCC	OCC	3+

Table 3. Identification, and TAT for media tested across days

ID	Without Enrichment Broth																		With Enrichment Broth															
	MS									Vitek 2									MS									Vitek 2								
	CP D1	CP D2	CP SC	BC D1	BC D2	BC SC	SA D1	SA D2	SA SC	CP D1	CP D2	CP SC	BC D1	BC D2	BC SC	SA D1	SA D2	SA SC	CP D1	CP D2	CP SC	BC D1	BC D2	BC SC	SA D1	SA D2	SA SC	CP D1	CP D2	CP SC	BC D1	BC D2	BC SC	SA D1	SA D2	SA SC
1																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
2																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
3																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~		~
4																			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5																			~	~	~	~	3	~	~	~	~	~	~	~	~	~	~	~	~	~
6																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
7																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
8																		1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
10																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
11																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
12																	2		~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
13																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
14																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
15																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
16																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
17																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
18																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
19																			~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
20																			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21																			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Identified as C. auris; Identified as non-C. auris; ID not performed; Low Discrimination; ~ Broth added 2 additional days to TAT; * Broth added 3 additional days to TAT; 1 Misidentified as *C. spherica*; 2 Misidentified as *C. terreus*; 3 Misidentified as *C. tropicalis* by MS

Results

Table 4. Added Turnaround Time from Auris Enrichment Broth Compared to Without Enrichment Broth

Medium	Mean (±SD) Increase in TAT (days) using MS Identification	Mean (±SD) Increase in TAT (days) using Vitek 2 Identification
Candida Plus	1.8 ± 0.8	1.5 ± 0.9
Brilliance Candida	2.0 ± 0.9	2.0 ± 0.9
Sabouraud	1.5 ± 0.7	1.8 ± 0.9

Conclusion

Auris Enrichment Broth

- Increased visible growth on all media
- Increased TAT by ~1.5-2.0 days
- Did not improve *C. auris* recovery versus direct culture

Organism Identification

- Vitek MS correctly identified all isolates; one *C. auris* isolate required repeat testing for correct identification
- Vitek 2 produced several low-discrimination results and two misidentifications

Candida Plus (CP)

- Supported robust growth and clear differentiation of *C. auris* (light blue halo)
- Only medium enabling accurate Vitek MS identification from direct culture in <24 hours
- Preferred by technologists from workflow and interpretability

Brilliance Candida (BC)

- Suppressed non-target yeast growth, reducing additional ID testing
- Supported clear differentiation of *C. auris* (golden-brown colonies)
- Associated with longer TAT versus CP

Sabouraud Dextrose Agar (SA)

- Supported growth of all evaluated species
- Limited colony contrast made mixed cultures harder to interpret
- Associated with longer TAT versus CP

Acknowledgements

We would like to thank PHOL for providing *C. auris* isolates used in this study

References

1. Public Health Ontario. *Candida auris IPC Guide.* 2019.
2. World Health Organization. *WHO Fungal Priority Pathogens List.* 2022.
3. Kathuria S, et al. *J Clin Microbiol.* 2015;53. doi:10.1128/JCM.00367-15