

TABLE 6-16 Differentiation of the Major Genera and Species Within the Tribe *Klebsiellae*

Biochemical Test	<i>Klebsiella</i>		<i>Enterobacter</i>		<i>Pantoea</i>	<i>Hafnia</i>	<i>Serratia</i>	
	<i>K. pneumoniae</i>	<i>K. oxytoca</i>	<i>E. aerogenes</i>	<i>E. cloacae</i>	<i>P. agglomerans</i>	<i>H. alvei</i>	<i>S. marcescens</i>	<i>S. liquefaciens</i>
Indole	–	+	–	–	V (20)	–	–	–
Motility	–	–	+	+	V (85)	V (85)	+	+
Lysine	+	+	+	–	–	+	+	+
Arginine	–	–	–	+	–	–	–	–
Ornithine	–	–	+	+	–	+	+	+
DNase (25°C)	–	–	–	–	–	–	+	V (85)
Gelatinase (22°C)	–	–	–	–	–	–	+	+
Fermentation of:								
Lactose	+	+	+	+	V (40)	–	–	–
Sucrose	+	+	+	+	V (75)	–	+	+
Sorbitol	+	+	+	+	V (30)	–	+	+
Adonitol	+	+	+	V (25)	–	–	V (40)	–
Arabinose	+	+	+	+	+	+	–	+

+ , 90% or more strains positive; – , 90% or more strains negative; V, 11%–89% of strains positive.

	MOTILE, STRONGLY SACCHAROLYTIC NONFERMENTERS										MOTILE, WEAK, OR NONSACCHAROLYTIC NONFERMENTERS										
	<i>Pseudomonas aeruginosa</i>	<i>Pseudomonas fluorescens/pulida</i>	<i>Burkholderia cepacia</i>	<i>Achromobacter xylosoxidans</i>	<i>Stenotrophomonas maltophilia</i>	<i>Burkholderia pseudomallei</i>	<i>Pseudomonas stutzeri</i>	<i>Sphingomonas paucimobilis</i>	<i>Pseudomonas mendocina</i>	<i>Raistonia pickettii</i>	<i>Deiftia acidovorans</i>	<i>Pseudomonas pseudoalcaligenes</i>	<i>Alcaligenes faecalis</i>	<i>Achromobacter denitrificans</i>	<i>Oligella ureolytica</i>	<i>Bordetella bronchiseptica</i>	<i>Pseudomonas alcaligenes</i>	<i>Brevundimonas diminuta</i>	<i>Brevundimonas vesicularis</i>	<i>Comamonas testosteroni</i>	<i>Shewanella putrefaciens</i>
Oxidase	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pyocyanin	+/-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorescein	+	-/+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glucose	+	+	+	+/-	+/-	+	+	+/-	+	+	-	-/+	-	-	-	-	-	-	+	-	-
Xylose	+	+	+/-	+	-	+	-/+	+/-	+	+	-	-	-	-	-	-	-	-	-	-	-
Mannitol	+/-	+/-	+/-	-	-	+	-/+	-	-	-	+/-	-	-	-	-	-	-	-	-	-	-
Lactose	-	-	+/-	-	-	+	+/-	+/-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maltose	-	-	+/-	-	+	+	+/-	+/-	-	-	-	-/+	-	-	-	-	-	-	+	-	-
42° C	+	-	+/-	+	+/-	+	+	-	+	+/-	-	+	+/-	-/+	-	+	+/-	-/+	+/-	+/-	+/-
Esculin	-	-	-/+	-	+	+/-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-
Urea	+	-/+	+/-	-	+/-	-/+	-/+	-/+	+/-	+	-	-	-/+	-	+	+	-/+	+/-	-	-	+/-
DNase	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	+
ONPG	-	-	+/-	-	+	-	-	+/-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Motility	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+
Flagella	1	>1	>1	P	>1	>1	1	1	1	1	>1	1	P	P	P	P	1	1	1	>1	1
H ₂ S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
N ₂ gas	+/-	-	-	-	-	+	+	-	+	-/+	-	-	+	+/-	+	-	-	-	-	-	-
Pigment	B,F,G	F	Y	-	Y	-	B,Y	Y	-	-	-	-	-	-	-	-	-	-	B,Y	-	B
Growth on MacConkey	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	-/+	+/-	+

FIGURE 21-2 Biochemical and morphologic characteristics of selected nonfermentative gram-negative bacilli. *ONPG*, o-Nitrophenyl-β-D-galactopyranoside; +, most strains positive; -, most strains negative; B, brown; F, fluorescein; G, green; Y, yellow. (Data from the Ohio State University Hospital, Columbus, Ohio.)

	NONMOTILE, PIGMENTED, INDOLE-POSITIVE NONFERMENTERS				NONMOTILE COCCOBACILLI	
	<i>Elizabethkingia meningosepticum</i>	<i>Myroides odoratus</i>	<i>Bergeyella zoohelcum</i>	<i>Weeksella virosa</i>	<i>Moraxella</i> sp.	Oxidase negative
Oxidase	+	+	+	+	+	-
Pyocyanin	-	-	-	-	-	-
Fluorescein	-	-	-	-	-	-
Glucose	+/-	-	-	-	-	+
Xylose	-	-	-	-	-	+
Mannitol	-/+	-	-	-	-	-
Lactose	-	-	-	-	-	+
Maltose	-/+	-	-	-	-	+/-
42° C	+/-	-	-	-/+	-/+	+
Esculin	+	-	-	-	-	-
Urea	-/+	+	+	-/+	-	-/+
DNase	+	+	+	+	-	-/+
ONPG	+/-	-	-	-	-	-
Indole	+	-	-/+	+	-	-
Motility	-	-	-	-	-	-
Flagella	-	-	-	-	-	-
H ₂ S	-	-	-	-	-	-
N ₂ gas	-	-/+	-	-	-	-
Pigment	Y	Y	B	B	-	-
Growth on MAC	+	+	-	-	+/-	+

Flagella

1, Polar monotrichous



>1, Polar tuft (>1 flagellum)



P, Peritrichous

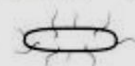
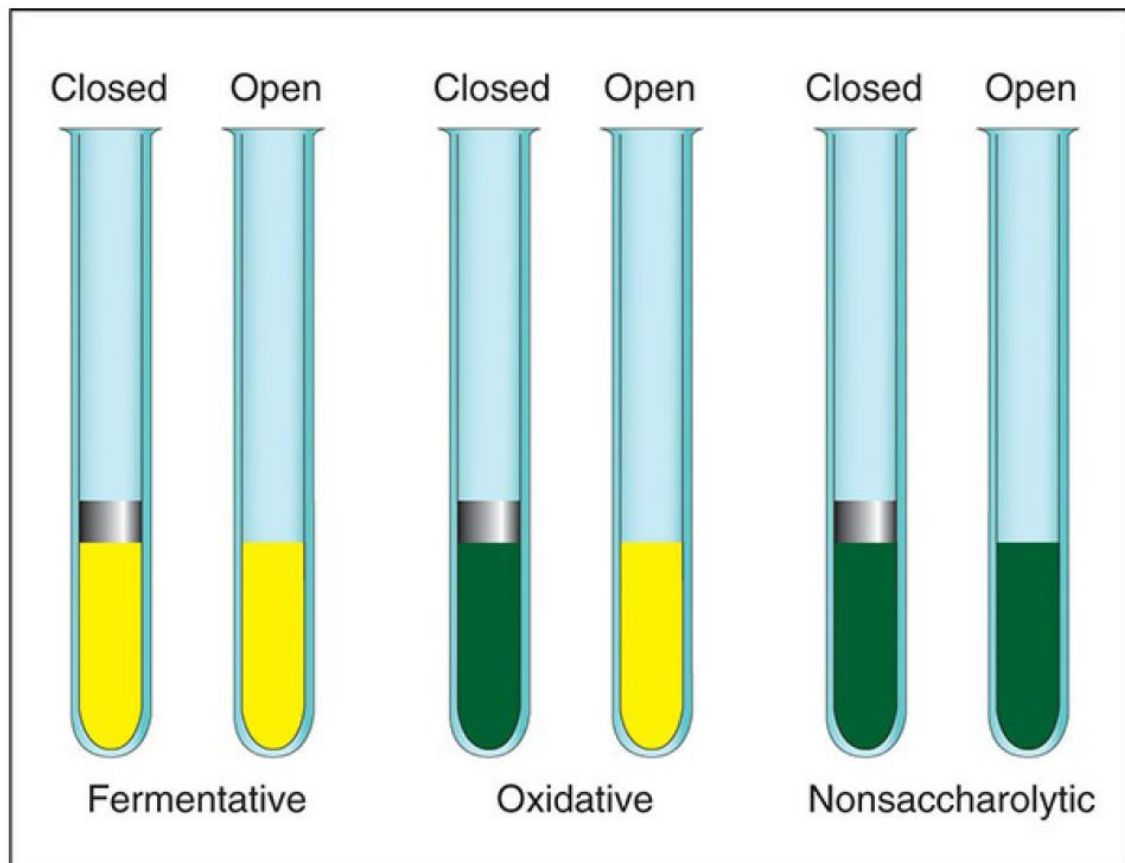


FIGURE 21-2, cont'd.



■ **FIGURE 7-2** The oxidative-fermentative (OF) test. Fermentative organisms produce acid in both the closed and open tubes (*yellow*); oxidative organisms produce acid only in the open tube. Asaccharolytic organisms that do not use carbohydrates produce no change in either tube.

TABLE 7-11 Key Characteristics of *S. maltophilia* and *B. cepacia* complex^a

Test	<i>S. maltophilia</i>	<i>B. cepacia</i> Complex
Oxidase	–	+ (93)
Motility	+	+
Growth on MacConkey	+	+
OF glucose	A or Wk	A
OF maltose	A	A
OF lactose	V (86)	A
OF mannitol	–	A
NO ₃ reduction	V (42)	V (37)
NO ₃ to gas	–	–
Arginine	–	–
Lysine	+	V
Esculin hydrolysis	+	V (67)
ONPG	+ (93)	V (79)
DNase	+	–
Polymyxin B	S	R
Pigment	gray, slight yellow, lavender	gray, chartreuse, yellow

^a Data from reference 1172.

+, 90% or more strains positive; –, 90% or more strains negative; V, 11%–89% of strains positive; A, acid reaction; Wk, weak acid; S, susceptible; R, resistant; NA, not available. Numbers in parentheses are percentage of strains giving positive reaction.

مراجع:

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