



Differentiation of *Listeria* species

	<i>L. monocytogenes</i>	<i>L. ivanovii</i>	<i>L. innocua</i>	<i>L. welshmerii</i>	<i>L. seeligeri</i>	<i>L. grayii</i>	<i>L. murai</i>	* <i>L. dentrificans</i>
Beta haemolysis on blood agar	+	++	-	-	(+)	-	-	-
Nitrate reduction	-	-	-	-	-	-	+	+
CAMP test with <i>S. aureus</i>	+	-	-	-	(+)	-	-	-
CAMP test with <i>R. equi</i>	-	+	-	-	-	-	-	-
Acid production	-	-	-	-	-	+	+	-
D-mannitol	-	-	-	-	-	-	-	-
L-rhamnose	+	-	V	V	-	-	V	-
D-xylose	-	+	-	+	+	-	-	+
α -Methyl D-manno pyranoside	+	-	+	+	V	NS	NS	NS

V = Variable reaction

NS = Not stated

* *Jonesia denitrificans*



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|-------------------------------|------------------------------|
| c) MRVP test | Positive, Positive (+, +) |
| d) Urease test | Negative |
| e) Catalase test | Positive (may be weakly +ve) |
| f) Cytochrome oxidase test | Negative |
| g) Asculin hydrolysis | Positive |
| h) Acid from glucose | Acid only, no gas produced |
| i) Acid from salicin | Positive. |
| j) Motility (in BHI at 30°C) | |

Tumbling motility (Test for Umbrella motility in soft agar media in a tube)

Those cultures giving the above characteristic reactions belong to *Listeria* genus.

Further test for confirmation as *Listeria monocytogenes* :-

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| 1. Nitrate reduction | : Negative. |
| 2. Acid from D- mannitol | : Negative. |
| 3. Acid from L- Rhamnose | : Positive. |
| 4. Acid from D- xylose | : Negative. |
| 5. Acid from α -methyl-D- manno- pyranoside | : Positive. |
| 5. Beta - haemolysis on blood agar | : Positive (Haemolysis will be seen only at the bottom of the colony in the case of <i>L. monocytogenes</i>) |

Note : If Beta - haemolysis is **negative**, then the culture is *Listeria innocua*.

6. CAMP test: *L. monocytogenes* give enhanced haemolysis with *Staphylococcus aureus*, but reduced haemolysis with *Rhodococcus equi*.

Notes:

1. Haemolysis

Even though *Listeria monocytogenes* is β -haemolytic, the zone of haemolysis is very small. So, examine the haemolysis beneath the colony. Alternately, stab inoculate the thick blood agar plate, so that haemolysis will be visible.

L. seeligeri also produces a small zone of haemolysis, but *L. ivanovii* produces a wider (3-5 mm) and clearer zone.

2. CAMP Test

A thin layer of sheep blood agar (5% v/v in nutrient agar) is poured into the surface of a nutrient agar base plate, and dried before use. The test is carried out by streaking *Staphylococcus aureus* or *Rhodococcus equi* across the sheep blood agar plate. Test strains are streaked at right angles to the *S. aureus* or *R. equi* so that the cultures are at their closest about 1-2 mm apart. Plates are incubated at 37°C overnight. Positive results are obtained when an enhanced zone of haemolysis between the two cultures occurs.

