

# 沙门氏菌属的一个新血清型

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从鳝鱼的标本中分离出一株沙门氏菌 757, 经鉴定为一新血清型。其生化特性符合沙门氏菌属的定义。根据该菌株卫矛醇反应阴性,丙二酸钠、乳糖、ONPG 反应阳性, 将其归属于沙门氏菌亚种 IIIb。757 菌株的“O”抗原为 43<sub>1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59,61,63,65,67,69,71,73,75,77,79,81,83,85,87,89,91,93,95,97,99,101,103,105,107,109,111,113,115,117,119,121,123,125,127,129,131,133,135,137,139,141,143,145,147,149,151,153,155,157,159,161,163,165,167,169,171,173,175,177,179,181,183,185,187,189,191,193,195,197,199,201,203,205,207,209,211,213,215,217,219,221,223,225,227,229,231,233,235,237,239,241,243,245,247,249,251,253,255,257,259,261,263,265,267,269,271,273,275,277,279,281,283,285,287,289,291,293,295,297,299,301,303,305,307,309,311,313,315,317,319,321,323,325,327,329,331,333,335,337,339,341,343,345,347,349,351,353,355,357,359,361,363,365,367,369,371,373,375,377,379,381,383,385,387,389,391,393,395,397,399,401,403,405,407,409,411,413,415,417,419,421,423,425,427,429,431,433,435,437,439,441,443,445,447,449,451,453,455,457,459,461,463,465,467,469,471,473,475,477,479,481,483,485,487,489,491,493,495,497,499,501,503,505,507,509,511,513,515,517,519,521,523,525,527,529,531,533,535,537,539,541,543,545,547,549,551,553,555,557,559,561,563,565,567,569,571,573,575,577,579,581,583,585,587,589,591,593,595,597,599,601,603,605,607,609,611,613,615,617,619,621,623,625,627,629,631,633,635,637,639,641,643,645,647,649,651,653,655,657,659,661,663,665,667,669,671,673,675,677,679,681,683,685,687,689,691,693,695,697,699,701,703,705,707,709,711,713,715,717,719,721,723,725,727,729,731,733,735,737,739,741,743,745,747,749,751,753,755,757,759,761,763,765,767,769,771,773,775,777,779,781,783,785,787,789,791,793,795,797,799,801,803,805,807,809,811,813,815,817,819,821,823,825,827,829,831,833,835,837,839,841,843,845,847,849,851,853,855,857,859,861,863,865,867,869,871,873,875,877,879,881,883,885,887,889,891,893,895,897,899,901,903,905,907,909,911,913,915,917,919,921,923,925,927,929,931,933,935,937,939,941,943,945,947,949,951,953,955,957,959,961,963,965,967,969,971,973,975,977,979,981,983,985,987,989,991,993,995,997,999,1001,1003,1005,1007,1009,1011,1013,1015,1017,1019,1021,1023,1025,1027,1029,1031,1033,1035,1037,1039,1041,1043,1045,1047,1049,1051,1053,1055,1057,1059,1061,1063,1065,1067,1069,1071,1073,1075,1077,1079,1081,1083,1085,1087,1089,1091,1093,1095,1097,1099,1101,1103,1105,1107,1109,1111,1113,1115,1117,1119,1121,1123,1125,1127,1129,1131,1133,1135,1137,1139,1141,1143,1145,1147,1149,1151,1153,1155,1157,1159,1161,1163,1165,1167,1169,1171,1173,1175,1177,1179,1181,1183,1185,1187,1189,1191,1193,1195,1197,1199,1201,1203,1205,1207,1209,1211,1213,1215,1217,1219,1221,1223,1225,1227,1229,1231,1233,1235,1237,1239,1241,1243,1245,1247,1249,1251,1253,1255,1257,1259,1261,1263,1265,1267,1269,1271,1273,1275,1277,1279,1281,1283,1285,1287,1289,1291,1293,1295,1297,1299,1301,1303,1305,1307,1309,1311,1313,1315,1317,1319,1321,1323,1325,1327,1329,1331,1333,1335,1337,1339,1341,1343,1345,1347,1349,1351,1353,1355,1357,1359,1361,1363,1365,1367,1369,1371,1373,1375,1377,1379,1381,1383,1385,1387,1389,1391,1393,1395,1397,1399,1401,1403,1405,1407,1409,1411,1413,1415,1417,1419,1421,1423,1425,1427,1429,1431,1433,1435,1437,1439,1441,1443,1445,1447,1449,1451,1453,1455,1457,1459,1461,1463,1465,1467,1469,1471,1473,1475,1477,1479,1481,1483,1485,1487,1489,1491,1493,1495,1497,1499,1501,1503,1505,1507,1509,1511,1513,1515,1517,1519,1521,1523,1525,1527,1529,1531,1533,1535,1537,1539,1541,1543,1545,1547,1549,1551,1553,1555,1557,1559,1561,1563,1565,1567,1569,1571,1573,1575,1577,1579,1581,1583,1585,1587,1589,1591,1593,1595,1597,1599,1601,1603,1605,1607,1609,1611,1613,1615,1617,1619,1621,1623,1625,1627,1629,1631,1633,1635,1637,1639,1641,1643,1645,1647,1649,1651,1653,1655,1657,1659,1661,1663,1665,1667,1669,1671,1673,1675,1677,1679,1681,1683,1685,1687,1689,1691,1693,1695,1697,1699,1701,1703,1705,1707,1709,1711,1713,1715,1717,1719,1721,1723,1725,1727,1729,1731,1733,1735,1737,1739,1741,1743,1745,1747,1749,1751,1753,1755,1757,1759,1761,1763,1765,1767,1769,1771,1773,1775,1777,1779,1781,1783,1785,1787,1789,1791,1793,1795,1797,1799,1801,1803,1805,1807,1809,1811,1813,1815,1817,1819,1821,1823,1825,1827,1829,1831,1833,1835,1837,1839,1841,1843,1845,1847,1849,1851,1853,1855,1857,1859,1861,1863,1865,1867,1869,1871,1873,1875,1877,1879,1881,1883,1885,1887,1889,1891,1893,1895,1897,1899,1901,1903,1905,1907,1909,1911,1913,1915,1917,1919,1921,1923,1925,1927,1929,1931,1933,1935,1937,1939,1941,1943,1945,1947,1949,1951,1953,1955,1957,1959,1961,1963,1965,1967,1969,1971,1973,1975,1977,1979,1981,1983,1985,1987,1989,1991,1993,1995,1997,1999,2001,2003,2005,2007,2009,2011,2013,2015,2017,2019,2021,2023,2025,2027,2029,2031,2033,2035,2037,2039,2041,2043,2045,2047,2049,2051,2053,2055,2057,2059,2061,2063,2065,2067,2069,2071,2073,2075,2077,2079,2081,2083,2085,2087,2089,2091,2093,2095,2097,2099,2101,2103,2105,2107,2109,2111,2113,2115,2117,2119,2121,2123,2125,2127,2129,2131,2133,2135,2137,2139,2141,2143,2145,2147,2149,2151,2153,2155,2157,2159,2161,2163,2165,2167,2169,2171,2173,2175,2177,2179,2181,2183,2185,2187,2189,2191,2193,2195,2197,2199,2201,2203,2205,2207,2209,2211,2213,2215,2217,221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9,2221,2223,2225,2227,2229,2231,2233,2235,2237,2239,2241,2243,2245,2247,2249,2251,2253,2255,2257,2259,2261,2263,2265,2267,2269,2271,2273,2275,2277,2279,2281,2283,2285,2287,2289,2291,2293,2295,2297,2299,2301,2303,2305,2307,2309,2311,2313,2315,2317,2319,2321,2323,2325,2327,2329,2331,2333,2335,2337,2339,2341,2343,2345,2347,2349,2351,2353,2355,2357,2359,2361,2363,2365,2367,2369,2371,2373,2375,2377,2379,2381,2383,2385,2387,2389,2391,2393,2395,2397,2399,2401,2403,2405,2407,2409,2411,2413,2415,2417,2419,2421,2423,2425,2427,2429,2431,2433,2435,2437,2439,2441,2443,2445,2447,2449,2451,2453,2455,2457,2459,2461,2463,2465,2467,2469,2471,2473,2475,2477,2479,2481,2483,2485,2487,2489,2491,2493,2495,2497,2499,2501,2503,2505,2507,2509,2511,2513,2515,2517,2519,2521,2523,2525,2527,2529,2531,2533,2535,2537,2539,2541,2543,2545,2547,2549,2551,2553,2555,2557,2559,2561,2563,2565,2567,2569,2571,2573,2575,2577,2579,2581,2583,2585,2587,2589,2591,2593,2595,2597,2599,2601,2603,2605,2607,2609,2611,2613,2615,2617,2619,2621,2623,2625,2627,2629,2631,2633,2635,2637,2639,2641,2643,2645,2647,2649,2651,2653,2655,2657,2659,2661,2663,2665,2667,2669,2671,2673,2675,2677,2679,2681,2683,2685,2687,2689,2691,2693,2695,2697,2699,2701,2703,2705,2707,2709,2711,2713,2715,2717,2719,2721,2723,2725,2727,2729,2731,2733,2735,2737,2739,2741,2743,2745,2747,2749,2751,2753,2755,2757,2759,2761,2763,2765,2767,2769,2771,2773,2775,2777,2779,2781,2783,2785,2787,2789,2791,2793,2795,2797,2799,2801,2803,2805,2807,2809,2811,2813,2815,2817,2819,2821,2823,2825,2827,2829,2831,2833,2835,2837,2839,2841,2843,2845,2847,2849,2851,2853,2855,2857,2859,2861,2863,2865,2867,2869,2871,2873,2875,2877,2879,2881,2883,2885,2887,2889,2891,2893,2895,2897,2899,2901,2903,2905,2907,2909,2911,2913,2915,2917,2919,2921,2923,2925,2927,2929,2931,2933,2935,2937,2939,2941,2943,2945,2947,2949,2951,2953,2955,2957,2959,2961,2963,2965,2967,2969,2971,2973,2975,2977,2979,2981,2983,2985,2987,2989,2991,2993,2995,2997,2999,3001,2003,2005,2007,2009,2011,2013,2015,2017,2019,2021,2023,2025,2027,</sub>

肌醇	-	KCN	-
鼠李糖	+	硝酸盐还原	+
蕈糖	+	柠檬酸铵盐	+
木糖	+	丙二酸钠	+
乳糖	+	右旋酒石酸钾钠	+
甘露糖	+	左旋酒石酸钾钠	+
麦芽糖	+	消旋酒石酸钾钠	+
棉子糖	-	粘液酸	+
甘露醇	+	氧化酶	-
山梨醇	+	尿素酶	-
侧金盏花醇	-	色氨酸脱氨基酶	-
水杨苷	+	鸟氨酸脱羧酶	+
甘油品红培养基	+	赖氨酸脱羧酶	+
H <sub>2</sub> S	+	精氨酸双水解酶	-
靛基质	-	苯丙氨酸脱氨酶	-
VP	-	动力	+
蔗糖	-		

种/套中的 OD 多价血清凝集，并与 O:43, O:43<sub>1</sub>, O:43<sub>2</sub> 血清凝集，凝集强度均在十以上。定量凝集结果如下：与 O:43 (原效价为 1:1,280) 为 1:1,280; O:43<sub>1</sub> (原效价为 1:320) 为 1:320; O:43<sub>2</sub> (原效价为 1:320) 为 1:320。将此菌接种于 1% 软琼脂平板上，鞭毛发育后再检查 H 抗原。结果与 HF 多价血清凝集，并与 H 因子血清 z<sub>52</sub> 凝集，定量凝集效价为 1:3,200 (z<sub>52</sub> 血清效价为 1:3,200)。H 第一相抗原确定为 z<sub>52</sub> 后，以 Gard 氏平板法 (加入 z<sub>52</sub> 血清，浓度 1:100—1:200) 诱导三次，z<sub>52</sub> 抗原消失。此时与 HB 多价血清凝集，并与复合因子血清及单因子血清 e, h, e, n, x, n, x, z<sub>15</sub> 凝集，强度均在十以上。定量凝集结果，n (原效价为 1:6,400) 为 1:400; x (原效价为 1:1,600) 为 1:200; z<sub>15</sub> (原效价为 1:400) 为 1:200，与 h 因子血清的效价低于 1:50。上述结果表明，此菌株的“O”抗原为 43<sub>1,3,4</sub>，“H”第一相抗原为 z<sub>52</sub>，“H”第二相抗原为 e, n, x, z<sub>15</sub>。

## (二) 噬菌体裂解试验

757 菌株只被沙门氏菌 O-1 噬菌体裂解，而不被其它噬菌体裂解。

## (三) 血清学鉴定

757 菌株能与沙门氏菌因子血清 144

表 1 757 菌株“O”血清与标准菌株“O”抗原交叉吸收试验

Table 1 The results of cross absorption test using strain No. 757 “O” serum with standard *Salmonella* strain “O” antigen

抗血清 Serum	吸收用抗原 Antigen for absorption	试验用抗原 Antigen for test			
		757 菌株“O”	3274 菌株 O:43 <sub>1,2</sub>	1606 菌株 O:43 <sub>1,2,3</sub>	3285 菌株 O:43 <sub>1,3,4</sub>
757 菌 株 “O”	3274 菌株 O:43 <sub>1,2</sub>	吸收前 (a. a.)	640	160	320
	O:43 <sub>1,2</sub>	吸收后 (p. a.)	640	0	40
	1606 菌株 O:43 <sub>1,2,3</sub>	吸收前 (a. a.)	640	160	320
	O:43 <sub>1,2,3</sub>	吸收后 (p. a.)	320	0	0
	3285 菌株 O:43 <sub>1,3,4</sub>	吸收前 (a. a.)	640	160	320
	O:43 <sub>1,3,4</sub>	吸收后 (p. a.)	0	0	0

注：表内数据为凝集效价 It is for agglutination data in the table.

a. a.: Ante absorptum; p. a.: Post absorptum.

1. 757 菌株“O”抗原的进一步分析：757 菌株的“O”抗血清经 10 倍稀释后，与沙门氏菌 O<sub>1</sub>—O<sub>67</sub> 的标准菌株进行玻片凝集试验。结果表明，与沙门氏菌 3274 菌株 (*S. kingabwa* 43<sub>1,2,y;1,5</sub>) 凝集，效价为 1:160；与 1606 菌株 (*S. milwaukee* 43<sub>1,2,1,f,g:-</sub>) 凝集，效价为 1:320；与 3285 菌株 (*S. bunnic* 43<sub>1,3,4:e,n,x,z;1,5,7:z<sub>12</sub></sub>) 凝集，效价为 1:640；与 757 菌株“O”抗原凝集，效价为 1:640。与其他菌株均不凝集。将 757 菌株“O”抗血清与有关标准菌株“O”抗原进行交叉凝集吸收试验。表 1 结果表明，用 3274 菌株 (O:43<sub>1,2</sub>) 和 1606 菌株 (O:43<sub>1,2,3</sub>) 抗原均不能将 757 菌株“O”血清中的凝集素吸收完全，而 3285 菌株 (O:43<sub>1,3,4</sub>) 抗原可将其完全吸收。为进一步证实此结果，用 757 菌株“O”抗原吸收相应的标准“O”血清。表 2 结果表明，757 菌株“O”抗原不能将标准 O:43<sub>1,2,3,4</sub> 血清中的凝集素吸收完全。上述结果进一步证实 757 菌株“O”抗原为 43<sub>1,3,4</sub>。

2. 757 菌株“H”第一相抗原的进一步分析：将 757 菌株“H”第一相血清与标准 Ha—Hz<sub>62</sub> 的菌株进行玻片凝集及定量凝集试验。结果仅与 3190 菌株 (*S. tulare* 6,8:a:z<sub>52</sub>) 凝集，与 3190 菌株 (Hz<sub>52</sub>) 抗原的定量凝集效价为 1:3,200。交叉吸附试验说明，3190 菌株 (Hz<sub>52</sub>) 抗原可将 757 菌株“H”第一相血清中的凝集素吸收完全。用 757 菌株“H”第一相抗原也可将标准 z<sub>52</sub> 血清中的凝集素吸收完全。表 3 结果表明，757 菌“H”第一相抗原与 3190 菌株 z<sub>52</sub> 抗原相同。

3. 757 菌“H”第二相抗原的进一步分析：757 菌株“H”第二相血清能与标准 Ha—Hz<sub>6</sub> 菌株中的下列菌株凝集：171 菌株 (*S. newport* 6,8:e, h:1, 2), 224 菌株 (*S. abortus-equi* 4, 12:-e, n, x, z<sub>16</sub>), 1472 菌株 (*S. chester* 1,4(15), 12:e, h:e, n, x, z<sub>12</sub>), 1517 菌株 (*S. dares-salaam* 1, 9, 12:1, w:e, n, z<sub>16</sub>, z<sub>18</sub>), 177 菌株 (*S. glostrup* 6, 8:z<sub>10</sub>:e, n, z<sub>15</sub>), 1554 菌株 (*S.*

表 2 757 菌株“O”抗原与标准“O”血清交叉吸收试验

Table 2 The results of cross absorption test using strain No. 757 “O” antigen with standard *Salmonella* strain “O” serum

抗血清 Serum	吸收用抗原 Antigen for absorption 757 菌株“O”	试验抗原 Antigen for test			
		757 菌株“O”	3274 菌株 O:43 <sub>1,2</sub>	1060 菌株 O:43 <sub>1,2,3</sub>	3285 菌株 O:43 <sub>1,3,4</sub>
O:43 <sub>1,2,3,4</sub>	吸收前 (a. a.)	1,280	640	1,280	1,280
	吸收后 (p. a.)	0	320	640	0
O:43 <sub>3</sub>	吸收前 (a. a.)	320	—	160	320
	吸收后 (p. a.)	0	—	0	0
O:43 <sub>4</sub>	吸收前 (a. a.)	320	—	—	320
	吸收后 (p. a.)	0	—	—	0

注：“—”为未做 for not being done.

表3 757 菌株“H”第一相抗原交叉吸收试验

Table 3 The results of cross absorption test with strain No. 757 "H" phase I antigen

抗血清 Serum	吸收用抗原 Antigen for absorption	试验抗原 Antigen for test	
		757 菌株 H:z <sub>22</sub>	3190 菌株 H:z <sub>22</sub>
757 菌株“H” 第一相	3190 菌株 H:z <sub>22</sub>	吸收前 (a. a.)	3,200
		吸收后 (p. a.)	0
3190 菌株 H:z <sub>22</sub>	757 菌株 “H”第一相	吸收前 (a. a.)	3,200
		吸收后 (p. a.)	0

表4 757 菌株“H”第二相血清与有关标准抗原交叉吸收试验

Table 4 The results of cross absorption test with strain No. 757 "H" phase 2 serum

抗血清 Serum	吸收用抗原 Antigen for absorption	试验用抗原 Antigen for absorption						
		757 菌株 “H”第二相抗原	171 菌株 e, h	224 菌株 e, n, x, z <sub>16</sub>	1472 菌株 e, n, x, z <sub>17</sub>	1517 菌株 e, n, z <sub>16</sub> , z <sub>18</sub>	177 菌株 e, n, z <sub>15</sub>	1554 菌株 e, n, z <sub>15</sub> , z <sub>17</sub>
A 组	171 菌株 e, h	吸收前 (a. a.)	3,200	6,400	1,600	3,200	3,200	3,200
		吸收后 (p. a.)	3,200	0	1,600	3,200	3,200	3,200
B 组	224 菌株 e, n, x, z <sub>16</sub> , 1517 菌株 e, n, z <sub>16</sub> , z <sub>18</sub>	吸收前 (a. a.)	3,200	6,400	1,600	3,200	3,200	3,200
		吸收后 (p. a.)	800	0	0	0	400	200
C 组	177 菌株 e, n, z <sub>15</sub>	吸收前 (a. a.)	3,200	6,400	1,600	3,200	3,200	3,200
		吸收后 (p. a.)	1,600	0	200	200	400	0

sandigo 4, (5), 12:e, h:e, n, z<sub>15</sub>, z<sub>17</sub>) 及 757 菌株“H”第二相抗原。凝集强度均在++以上。定量凝集结果表明：757 菌株“H”第二相抗原 (e, h) 为 1:6,400; 与 224 菌株 (e, n, x, z<sub>16</sub>) 为 1:1,600; 与 1472 菌株 (e, n, x, z<sub>17</sub>) 为 1:3,200; 与 1517 菌株 (e, n, z<sub>16</sub>, z<sub>18</sub>) 为 1:3,200; 与 177 菌株 (e, n, z<sub>15</sub>) 为 1:3,200, 与 757 菌株“H”第二相抗原为 1:3,200。分别将 171 菌株 e, h 抗原、224 菌株 e, n, x, z<sub>16</sub> 抗原、1472 菌株 e, n, x, z<sub>17</sub> 抗原、1517 菌

株 e, n, z<sub>16</sub>, z<sub>18</sub> 抗原、177 菌株 e, n, z<sub>15</sub> 和 1554 菌株 e, n, z<sub>15</sub>, z<sub>17</sub> 抗原制成吸收抗原, 分为三组分别吸收 757 菌株“H”第二相血清, 结果见表 4。结果表明, A 组 171 菌株 e, h 抗原不能将 757 菌株“H”第二相血清中的凝集素吸收完全。说明除 e 外, 尚含有其他抗原成份。B 组 224 菌株的 e, n, x, z<sub>16</sub> 和 1517 菌株的 e, n, z<sub>16</sub>, z<sub>18</sub> 抗原仅能将血清中的 e, n, x 抗原成份吸收完全, 成为一份含有 z<sub>17</sub> 因子的血清。而 C 组 177 菌株 (e, n, z<sub>15</sub>) 抗原仅能将

表5 757 菌株“H”第二相血清(C组)吸收前后凝集素交叉吸收试验

Table 5 The results of cross absorption test with strain No. 757 “H” phase 2 serum of absorbed “C” group

抗血清 Serum	吸收用抗原 Antigen for absorption	试验抗原 Antigen for test					
		757 菌株“H” 第二相	224 菌株 e, n, x, z <sub>16</sub>	1472 菌株 e, n, x, z <sub>17</sub>	1517 菌株 e, n, x, z <sub>17</sub>	177 菌株 e, n, z <sub>15</sub>	1554 菌株 e, n, z <sub>15</sub> , z <sub>18</sub>
吸收后 C 组血清	224 菌株 e, n, x, z <sub>16</sub>	吸收前 (a. a.)	1,600	200	200	400	0
	1517 菌株 e, n, z <sub>15</sub> , z <sub>18</sub>	吸收后 (p. a.)	400	0	0	0	0

表6 757 菌株“H”第二相抗原与标准“H”因子血清交叉吸收试验

Table 6 The results of cross absorption test using strain No. 757 “H” phase 2 antigen to absorb the standard “H” monovalent serum

抗血清 Serum	吸收用抗原 Antigen for absorption	试验抗原 Antigen for test			
		757 菌株“H” 第二相抗原	1517 菌株 e, n, z <sub>15</sub> , z <sub>18</sub>	224 菌株 e, n, x, z <sub>16</sub>	1554 菌株 e, n, z <sub>15</sub> , z <sub>18</sub>
n	吸收前 (a. a.)	400	6,400	—	—
	吸收后 (p. a.)	0	0	—	—
x	吸收前 (a. a.)	200	—	1,600	—
	吸收后 (p. a.)	0	—	0	—
z <sub>15</sub>	吸收前 (a. a.)	200	—	—	400
	吸收后 (p. a.)	0	—	—	0

注：“—”为未做 for not being done。

757 菌株“H”第二相血清中的 e, n, z<sub>15</sub> 抗体成份吸收完全，成为一份含有 X 因子的血清。为证实除 e, n, x, z<sub>15</sub> 成份以外是否仍有其他成份，在吸收后的 C 组血清的基础上用 224 菌株 (e, n, x, z<sub>16</sub>) 抗原和 1517 菌株 (e, n, z<sub>15</sub>, z<sub>18</sub>) 抗原继续吸收，结果见表 5。

C 组血清经 177 菌株 (e, n, z<sub>15</sub>) 抗原吸收后除去了 e, n, z<sub>15</sub> 的抗体成份，继续用 224 菌株 (e, n, x, z<sub>16</sub>) 抗原和 1517 菌株 (e, n, z<sub>15</sub>, z<sub>18</sub>) 抗原吸收后，除去了 X

因子抗体成份。此时的血清仍与 757 菌株 H 第二相抗原残留 1:400 的效价。我们还采用了上述活菌进行过量吸收，仍不能将其吸收完全。这份含有未知成份的血清再不与所有的标准 O<sub>1</sub>—O<sub>62</sub>, Ha—Hz<sub>62</sub> 的菌株凝集，说明还含有其他抗体成份。为确证 757 菌株“H”第二相抗原的 e, n, x, z<sub>15</sub> 成份，用 757 菌株“H”第二相抗原吸收标准“H”因子血清 n, x, z<sub>15</sub>，结果见表 6。结果表明，757 菌株“H”第二相抗原可将标准“H”因子血清 n, x, z<sub>15</sub> 中的凝集素

吸收完全。进一步证实了此菌株“H”第二相抗原成份为e, n, x, z<sub>15</sub>···。

根据757菌株与有关血清的凝集素作用及其抗原性和吸收已知“O”、“H”抗体的能力,确认757菌株的“O”抗原为43,“O”部分抗原为43<sub>1</sub>, 43<sub>3</sub>, 43<sub>4</sub>, “H”第一相抗原为z<sub>52</sub>, “H”第二相抗原为e, n, x, z<sub>15</sub>···。

757菌株的形态、培养特征和生化特性均符合沙门氏菌属的定义。根据其卫矛醇反应阴性,乳糖、ONPG和丙二酸钠反应阳性,将其归属于沙门氏菌属亚种IIIb<sup>[5]</sup>。757菌株的抗原式为43:z<sub>52</sub>:e, n, x, z<sub>15</sub>···。“H”第二相抗原中除已知e, n, x, z<sub>15</sub>以外的成份,暂用“···”标记。此抗原式迄今尚未见有报告<sup>[6-8]</sup>,为沙门氏菌属的一个新血清型。

## 参 考 文 献

- [1] 四川省自贡市卫生防疫站等: 微生物学报, 19(3): 227—229, 1979。
- [2] 刘湘平等: 中华预防医学杂志, 18(1): 45—46, 1984,
- [3] Edwards, P. R. & W. H. Ewing: Identification of Enterobacteriaceae, 3rd., Burgess, Minneapolis, pp. 337—356, 1972.
- [4] 潘若男等: 中华微生物学和免疫学杂志, 1: 260—264, 1981。
- [5] WHO Collaborating Centre for Reference and Research on *Salmonella*: Antigenic formulae of the *Salmonella*, 1984.
- [6] WHO Collaborating Centre for Reference and Research on *Salmonella*: Antigenic formulae of the *Salmonella*. Kauffmann—White scheme supplemented by the formulae approved up to 31 December 1980 and including of *S. arizona*. Document OM. S BD/72 Rev. 3.
- [7] Minor, L. L. et al.: *Ann. Microbiol. (Inst. Pasteur)*, 134A: 107—110, 1980.
- [8] Minor, L. L. et al.: *Ann. Microbiol. (Inst. Pasteur)*, 134B: 323—328, 1983.

## A NEW SEROTYPE OF *SALMONELLA*

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A new serotype of *Salmonella*, No. 757, was isolated from a finless eel at Xinyang in Apr 1980. It could be classified into subspecies IIIb, because the biochemical reaction of sodium malonate and lactose as well as ONPG were positive. Antigenic analysis showed that

it represented a new serotype with an antigenic formulae of 43:z<sub>52</sub>:e, n, x, z<sub>15</sub>···

### Key words

*Salmonella*; Serotype

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