***P. aeruginosa* environmental strains from fresh water (*n* = 114)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **virulence genes** | | | | | | | | | | | | | | | **Antimicrobial susceptibility** | | | | | | | | | | | |
| **No.** | **Strain** | **Date** | **Location** | **GPS** | **apr** | **lasB** | **phzI** | **phzII** | **phzH** | **phzM** | **phzS** | **exoS** | **exoT** | **exoU** | **exoY** | **pvdA** | **pilB** | **lecA** | **lecB** | **MEM** | **DOR** | **IMI** | **CAZ** | **PTZ** | **TIM** | **PRL** | **CIP** | **AK** | **CN** | **NET** |
| 1 | P2 | 24/8/2015 | Fish pond, UMMC lobby | N03°06.799 E101°39.136 | X | √ | √ | X | √ | √ | √ | X | √ | √ | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 2 | P5 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | S | I | S | S | S | S | S |
| 3 | F1 | 24/8/2015 | Fountain, Gynae & Peds Building UMMC | N03°06.726 E101°39.260 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | **R** | S | S | S | I | S | S | S | S | S |
| 4 | F5 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | **R** | S | S | S | I | S | S | S | S | S |
| 5 | F8 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | **R** | S | S | S | I | S | S | S | S | S |
| 6 | F9a | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | **R** | S | S | S | I | S | S | S | S | S |
| 7 | UL2 | 09/01/2015 | UM lake | N03°07.165 E101°39.514 | √ | √ | √ | X | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 8 | UL4a | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | S | I | S | S | S | S | S |
| 9 | UL6 | √ | √ | √ | X | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | S | **R** | S | S | S | S |
| 10 | UL17 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | **R** | S | S | I | S | S | S | S | S |
| 11 | UL19 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 12 | UW2 | 09/01/2015 | UM waterfall, Dewan Tunku Canselor | N03°07.311 E101°39.452 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | **R** | S | **R** | I | **R** | S | S | S | S |
| 13 | UW4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 14 | UW5 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 15 | UW7b | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | S | S | I | S | S | S | S |
| 16 | UW10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 17 | UW12 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 18 | UW13 | √ | √ | √ | √ | √ | X | √ | √ | √ | √ | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 19 | UW14 | √ | √ | √ | X | √ | √ | √ | √ | √ | X | √ | √ | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 20 | UW16 | √ | √ | √ | X | √ | √ | √ | X | √ | √ | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 21 | UW18 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | **R** | S | **R** | I | **R** | S | S | S | S |
| 22 | UW19 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 23 | UW21a | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | I | S | S | S | I | S | S | S | S | S |
| 24 | UW23 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 25 | DL5 | 09/06/2015 | Desa Parkcity Lake, KL | N03°11.198 E101°37.714 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | I | I | S | S | S | I | **R** | **R** | S | S | S |
| 26 | DL6 | √ | √ | √ | X | √ | √ | √ | √ | X | X | X | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 27 | DL12 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | I | S | S | S | S |
| 28 | DL13 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 29 | DL26 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 30 | DL27b | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | S | S | S | S | S | S | S |
| 31 | ML1 | 09/06/2015 | Menjalara Lake, KL | N03°11.736 E101°37.680 | √ | X | √ | X | X | √ | X | √ | X | X | X | X | X | X | X | S | S | S | S | S | I | S | S | S | S | S |
| 32 | ML2 | √ | √ | √ | X | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 33 | ML3 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 34 | ML11 | √ | √ | √ | X | √ | √ | √ | √ | X | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 35 | ML12 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 36 | ML14 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 37 | ML15 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 38 | ML16 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 39 | ML18 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 40 | ML19 | √ | √ | √ | X | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 41 | ML21 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 42 | ML24 | √ | √ | √ | √ | √ | X | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 43 | ML25 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 44 | ML26 | √ | √ | √ | X | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 45 | ML27 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 46 | JD1 | 13/9/2015 | Juara Drain, Bahau | N02°48.165 E102°24.462 | √ | √ | √ | X | √ | √ | √ | X | X | √ | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 47 | JD2 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | S | S | S | S | S | S | S | S | S | S | S |
| 48 | JD11 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 49 | JD13 | √ | √ | √ | X | √ | √ | √ | X | X | √ | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 50 | JD14 | X | √ | √ | X | √ | √ | X | √ | X | X | √ | X | X | X | √ | S | S | S | S | S | I | S | S | S | S | S |
| 51 | JD23 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 52 | JD26 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 53 | JD28 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | S | S | S | S | S | I | S | S | S | S | S |
| 54 | BL2 | 13/9/2015 | Bahau Lake | N02°48.456 E102°23.910 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 55 | BL4 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 56 | BL6 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 57 | BL7 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | X | S | S | S | S | S | I | I | S | S | S | S |
| 58 | BL11 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 59 | BL18 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | X | S | S | S | S | S | I | S | S | S | S | S |
| 60 | BL20 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 61 | UB3a | 13/9/2015 | Ulu Bendul, Negeri Sembilan | N02°43.782 E102°04.664 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 62 | UB7 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 63 | UB8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 64 | UB9 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 65 | UB11 | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 66 | UB12 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 67 | UB13a | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 68 | UB14a | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 69 | UB15 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 70 | UB17 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 71 | UB21 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 72 | UB24 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 73 | UB26 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | I | **R** | S | S | S |
| 74 | UB30 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 75 | CW3b | 18/10/2015 | Chi Wen fish pond, NS | N02°48.554 E102°24.212 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | I | S | S | S | I | I | S | S | S | S |
| 76 | CW6b | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | I | I | I | S | S | S | S |
| 77 | CW19 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | **R** | **R** | S | S | I | I | I | S | S | S | S |
| 78 | TW9 | 18/10/2015 | Temple well, NS | N02°48.087 E102°24.264 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 79 | TW19 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 80 | TW20 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 81 | TW23 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 82 | PD1 | 18/10/2015 | Paddy field, NS | N02°49.667 E102°20.056 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 83 | PD7 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | I | S | S | S | S |
| 84 | PD18 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 85 | LP1 | 11/01/2015 | Layang-layang pool, KL | N03°13.634 E101°38.935 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | √ | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 86 | LP4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 87 | LP6 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 88 | LP7 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 89 | LP10 | √ | √ | √ | √ | √ | X | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 90 | LP15 | √ | √ | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 91 | LP16 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 92 | LP18 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 93 | LP21 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 94 | LP25 | √ | √ | √ | X | √ | √ | √ | X | √ | √ | √ | √ | X | √ | X | S | S | S | S | S | I | I | S | S | S | S |
| 95 | LP29 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | **R** | S | S | S | S |
| 96 | LP32 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 97 | TL1 | 11/01/2015 | TTDI Lake, PJ | N03°08.834 E101°37.945 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 98 | TL3 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 99 | TL4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 100 | TL6 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 101 | TL8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 102 | TL9 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 103 | TL10 | √ | √ | √ | √ | √ | X | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 104 | TL11 | √ | √ | √ | √ | √ | X | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 105 | TL12 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 106 | TL14 | √ | √ | √ | X | X | √ | X | √ | √ | X | X | X | √ | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 107 | TL21 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 108 | TL22 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 109 | TL23 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 110 | TL24 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 111 | TL27 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 112 | LL1 | 11/01/2015 | Layang-layang Lake, KL | N03°13.634 E101°38.935 | √ | √ | √ | √ | √ | X | √ | √ | √ | X | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 113 | LL3 | √ | √ | √ | X | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 114 | LL10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | X | √ | X | X | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |

√ indicates presence of virulence genes; x indicates absence of virulence genes; S indicates susceptible; I indicates intermediate; R indicates resistant (according to CLSI guidelines M100-S26).

***P. aeruginosa* clinical strains from Johor Bahru, Malaysia (*n* = 53)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Virulence genes** | | | | | | | | | | | | | | | **Antimicrobial susceptibility** | | | | | | | | | | |
| **Strain** | **Year received** | **apr** | **lasB** | **phzI** | **phzII** | **phzH** | **phzM** | **phzS** | **exoS** | **exoT** | **exoU** | **exoY** | **pvdA** | **pilB** | **lecA** | **lecB** | **MEM** | **DOR** | **IMI** | **CAZ** | **PTZ** | **TIM** | **PRL** | **CIP** | **AK** | **CN** | **NET** | |
| J1 | 2/3/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J2 | 2/8/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J3 | 26/1/2015 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | **R** | **R** | **R** | **R** | **R** | S | S | S | S | |
| J4 | 2/9/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S | |
| J5 | 4/12/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S | |
| J6 | 2/9/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J7 | 2/9/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J8 | 4/10/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | I | S | S | S | S | |
| J9 | 2/10/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J10 | 2/9/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | √ | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J11 | 2/9/2015 | x | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | |
| J12 | 13/2/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J13 | 4/3/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J14 | 14/4/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J15 | 2/8/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J16 | 4/11/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J17 | 4/11/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J18 | 4/10/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J19 | 27/1/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J20 | 14/4/2015 | √ | √ | √ | √ | √ | x | √ | x | x | √ | √ | √ | x | √ | x | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | **R** | |
| J21 | 5/3/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J22 | 26/4/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J23 | 2/8/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J24 | 25/4/2015 | √ | √ | √ | √ | √ | x | √ | x | x | √ | √ | √ | √ | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J25 | 22/4/2015 | √ | √ | √ | √ | √ | x | √ | x | x | √ | √ | √ | x | √ | x | **R** | **R** | I | **R** | I | **R** | I | **R** | S | **R** | **R** | |
| J26 | 20/4/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | I | **R** | **R** | S | S | S | S | |
| J27 | 4/10/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S | |
| J28 | 20/4/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | I | **R** | I | S | S | S | S | |
| J29 | 25/4/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J30 | 29/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J31 | 23/5/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | **R** | S | S | S | S | S | |
| J32 | 24/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J33 | 24/5/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | I | **R** | **R** | S | S | S | S | |
| J34 | 20/4/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J35 | 25/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J36 | 14/2/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | **R** | **R** | **R** | |
| J37 | 3/8/2015 | x | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J38 | 3/3/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | **R** | **R** | **R** | **R** | S | S | S | S | |
| J39 | 3/3/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J40 | 30/3/2015 | √ | √ | √ | x | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J41 | 25/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J42 | 28/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | √ | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J43 | 14/2/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | √ | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J44 | 15/2/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J45 | 29/5/2015 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | S | S | S | S | S | **R** | S | S | S | S | S | |
| J46 | 21/2/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J47 | 3/6/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | I | **R** | S | S | I | S | S | S | S | S | |
| J48 | 26/5/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J49 | 14/2/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S | |
| J50 | 27/5/2015 | √ | √ | √ | √ | √ | x | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J51 | 28/5/2015 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | I | S | S | S | S | |
| J52 | 27/5/2015 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | √ | √ | x | S | S | S | S | S | I | S | S | S | S | S | |
| J53 | 29/5/2015 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | x | S | S | S | S | S | S | S | S | S | S | S | |

√ indicates presence of virulence genes; x indicates absence of virulence genes; S indicates susceptible; I indicates intermediate; R indicates resistant (according to CLSI guidelines M100-S26).

***P. aeruginosa* archived strains from isolation period 1977 to 1985 (*n* = 52)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Virulence genes** | | | | | | | | | | | | | | | **Antimicrobial susceptibility** | | | | | | | | | | |
| **Strain** | **Year received** | **apr** | **lasB** | **phzI** | **phzII** | **phzH** | **phzM** | **phzS** | **exoS** | **exoT** | **exoU** | **exoY** | **pvdA** | **pilB** | **lecA** | **lecB** | **MEM** | **DOR** | **IMI** | **CAZ** | **PTZ** | **TIM** | **PRL** | **CIP** | **AK** | **CN** | **NET** |
| 1 | 9/9/82 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | √ | x | √ | x | **R** | S | S | S | **R** | **R** | **R** | S | S | S | S |
| 3 | 26/1/78 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 4 | 20/4/79 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | **R** | **R** |
| 5 | 12/3/80 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | x | √ | x | S | S | I | S | S | **R** | S | S | S | S | S |
| 6 | 15/8/79 | √ | √ | √ | x | √ | √ | √ | √ | x | x | x | √ | x | x | √ | S | S | S | S | S | I | S | S | S | S | S |
| 7 | 29/11/76 | √ | √ | √ | x | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | **R** | **R** | **R** | S | S | **R** | **R** |
| 9 | 26/1/78 | x | x | x | x | x | x | x | x | x | x | x | x | √ | x | x | S | S | S | S | S | I | S | S | S | S | S |
| 10 | 20/4/79 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| 11 | 10/7/81 | √ | √ | x | x | √ | x | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | S | S | S | S | S | S |
| 12 | 28/6/79 | √ | √ | √ | √ | √ | √ | √ | √ | x | √ | √ | √ | x | √ | √ | S | S | S | S | I | **R** | **R** | S | S | **R** | **R** |
| 13 | 1/12/80 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | **R** | S | S | S | S | S |
| 14 | 10/3/1980 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | I | S | S | S | S | S |
| 15 | 26/1/78 | x | x | x | x | x | x | x | x | x | x | x | x | √ | x | x | S | S | S | S | S | I | S | S | S | S | S |
| 17 | 15/8/1979 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 18 | 9/3/78 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 19 | 26/1/1978 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 20 | 25/8/1978 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 21 | 26/1/78 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 22 | 25/8/78 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | I | S | S | S | S | S |
| 23 | 12/10/78 | √ | √ | √ | √ | √ | √ | √ | x | x | x | x | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| 24 | 25/8/1978 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | **R** | S | **R** | S | S | **R** | S | S | S | S | S |
| 25 | 24/2/78 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| 26 | 11/8/78 | √ | √ | √ | √ | √ | √ | √ | x | x | x | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | I |
| 27 | 23/12/77 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| 29 | 23/12/77 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 30 | 26/1/78 | x | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| 31 | 27/9/1977 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 32 | 23/12/77 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | S | S | S | S | S | I | S | S | S | S | S |
| 34 | 23/12/77 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | S | S | S | S | S | S | S | S | S | S | S |
| 35 | 23/12/77 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | **R** | I | S | S | S | S |
| 37 | 1/12/80 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | S | S | S | S | S | S |
| 38 | 13/3/1978 | √ | x | √ | x | x | √ | x | √ | x | x | x | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| 39 | 9/11/84 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | I | S | **R** | **R** | **R** | S | **R** | **R** | **R** |
| 40 | 17/1/85 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | x | √ | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x5 | 15/3/78 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | √ | √ | x | S | S | S | S | S | I | I | S | S | S | S |
| x9 | 20/3/79 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | I | S | S | S | S | S |
| x11 | 10/10/80 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x16 | 1/12/80 | √ | √ | √ | √ | √ | √ | √ | √ | x | √ | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x24 | 10/11/82 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | √ | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| x71 | 21/6/83 | √ | √ | √ | √ | √ | √ | √ | x | x | √ | x | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| x93 | 18/1/83 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x106 | 22/6/83 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x117 | 10/2/83 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | **R** | S | S | S | S | S |
| x121 | 9/11/84 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | **R** | **R** | S | S | S | **R** | S | S | S | S | S |
| x155 | 9/11/84 | √ | √ | √ | √ | √ | √ | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x188 | 15/1/85 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| x196 | 16/1/85 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | I | I | I |
| x199 | 16/1/85 | √ | √ | √ | √ | √ | x | √ | x | x | √ | √ | x | x | √ | x | S | S | S | S | S | I | S | S | S | S | S |
| PP48 | 25/10/83 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| PP57 | 22/2/84 | √ | √ | √ | √ | √ | x | √ | √ | x | x | x | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| PS3 | 8/9/83 | √ | √ | √ | √ | √ | x | √ | √ | x | x | √ | √ | x | √ | √ | S | S | S | S | S | I | S | S | S | S | S |
| PS4 | 30/5/84 | √ | √ | √ | √ | √ | x | √ | √ | x | √ | √ | √ | x | √ | x | S | S | S | S | **R** | I | **R** | S | S | S | I |

√ indicates presence of virulence genes; x indicates absence of virulence genes; S indicates susceptible; I indicates intermediate; R indicates resistant (according to CLSI guidelines M100-S26).