

# Identifikasi Bakteri Untypeable *Streptococcus pneumoniae* Menggunakan Gen *psaA*, *lytA*, *cpsA* dan *recA* = Untypeable *Streptococcus pneumoniae* Identification Using *psaA*, *lytA*, *cpsA* and *recA*

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## Abstrak

*Streptococcus pneumoniae* (*S. pneumoniae* atau pneumokokus) dapat menyebabkan Invasive Pneumococcal Disease (IPD), seperti pneumonia, meningitis, dan otitis media. *Streptococcus pneumoniae* memiliki lebih dari 90 serotipe yang berbeda sifat-sifat kepatogennya. Saat ini, metode molekuler lebih banyak diterapkan dalam penentuan serotipe bakteri tersebut. Penelitian sebelumnya pada anak-anak sehat di Lombok, menemukan bahwa 73 dari 551 isolat merupakan untypeable *S. pneumoniae* karena tidak dapat ditentukan serotipenya berdasarkan metode PCR multipleks. Pada penelitian ini dilakukan identifikasi lebih mendalam dengan mendeteksi tiga gen yang lestari (conserved genes) pada bakteri *S. pneumoniae* yaitu, gen *psaA*, *lytA*, dan *cpsA*. Sebanyak 52 isolat (71.2%) terdeteksi dengan PCR mempunyai gen *psaA*. Sementara itu, gen *lytA* terdeteksi pada 69 isolat (90.4%) dan gen *cpsA* terdeteksi pada 37 isolat (50.7%). Berdasarkan hasil deteksi gen *psaA*, *lytA*, dan *cpsA* diperoleh 6 kelompok varian untypeable *S. pneumoniae*. Analisa sekuens gen *recA* dengan metode sekuensing, menunjukkan bahwa kelompok varian I (*psaA*<sup>+</sup>, *lytA*<sup>+</sup>, *cpsA*<sup>+</sup>), II (*psaA*<sup>+</sup>, *lytA*<sup>+</sup>, *cpsA*<sup>-</sup>) dan IV (*psaA*<sup>-</sup>, *lytA*<sup>+</sup>, *cpsA*<sup>+</sup>) merupakan bakteri *S. pneumoniae*. Sementara itu, kelompok varian VI (*psaA*<sup>-</sup>, *lytA*<sup>+</sup>, *cpsA*<sup>-</sup>) merupakan bakteri *S. pseudopneumoniae* dan kelompok varian VIII (*psaA*<sup>-</sup>, *lytA*<sup>-</sup>, *cpsA*<sup>-</sup>) merupakan bakteri *S. infantis*. Hasil tersebut mengindikasikan bahwa identifikasi bakteri *S. pneumoniae* tidak dapat dilakukan hanya dengan satu penanda gen. Hasil penelitian ini penting untuk meningkatkan sensitifitas dari deteksi *S. pneumoniae* dengan teknik biologi molekuler.

.....*Streptococcus pneumoniae* (*S. pneumoniae* or pneumococcus) can cause Invasive Pneumococcal Disease (IPD), such as pneumonia, meningitis, and otitis media. *Streptococcus pneumoniae* has more than 90 serotypes which differentiated based on the level of pathogenicity. Currently, molecular methods were more widely applied to determine bacterial serotype. Previous studies of healthy children in Lombok, found that 73 of 551 isolates were untypeable *S. pneumoniae*, because the serotypes can not be determined by multiplex PCR method. This research used a deeper identification by detecting three conserved genes in *S. pneumoniae*, such as *psaA*, *lytA*, and *cpsA*. A total of 52 isolates (71.2%) were positive for *psaA* gene by PCR. Meanwhile, *lytA* gene was detected in 69 isolates (90.4%) and *cpsA* gene was detected in 37 isolates (50.7%).

Based on the result of *psaA*, *lytA* and *cpsA* gene detection, obtained 6 variants of untypeable *S. pneumoniae*. *recA* gene sequence analysis with sequencing method, showed that variant I, II and IV are *S. pneumoniae*. Meanwhile, variant VI is *S. pseudopneumoniae* and variant VIII is *S. infantis*. The results indicated that identification of the bacteria *S. pneumoniae* can not be done with just one marker gene. The results are important to increase the detection of *S. pneumoniae* with molecular biology techniques.