

ダイズさび病に高度の抵抗性を示す3種の判別品種は抵抗性遺伝子*Rpp1-b*をもつ

Three differential soybean varieties highly resistant to Asian soybean rust carry the resistance gene *Rpp1-b*

ダイズさび病は南米における大豆生産の最も大きな脅威の一つとなっている。ダイズさび病抵抗性品種の開発のため、さび病菌の判別品種のうちの4品種とその他の3つの抵抗性品種の抵抗性遺伝子座を決定した(図1)。判別品種のうち、PI 594767A、PI 587905、PI 587855は抵抗性遺伝子*Rpp1-b*を、抵抗性品種Xiao Jin HuangとHimeshirazuは遺伝子*Rpp1*を持つことが分かった。Iyodaizu BとPI 416764の抵抗性遺伝子座はそれぞれ*Rpp2*と*Rpp3*の遺伝子座に位置づけられた。これらのうち*Rpp1-b*を持つ3つの判別品種は非常に強い病原性を持ったさび病菌や南米の多くのさび病菌に抵抗性を示すため育種上の利用価値が高い(表1)。

Asian soybean rust (ASR) disease is one of the biggest threats to soybean production in South America. For the development of ASR-resistant cultivars, we mapped the resistance loci in four differential varieties together with three other resistant varieties (Fig. 1). We found that Xiao Jin Huang and Himeshirazu carry *Rpp1*, whereas PI 594767A, PI 587905, and PI 587855 carry *Rpp1-b*. Furthermore, the resistant loci in Iyodaizu B and PI 416764 were mapped on *Rpp2* and *Rpp3*, respectively. The three differentials carrying *Rpp1-b* are useful for breeding because of their resistance to highly virulent and most ASR pathogens from South America (Table 1).

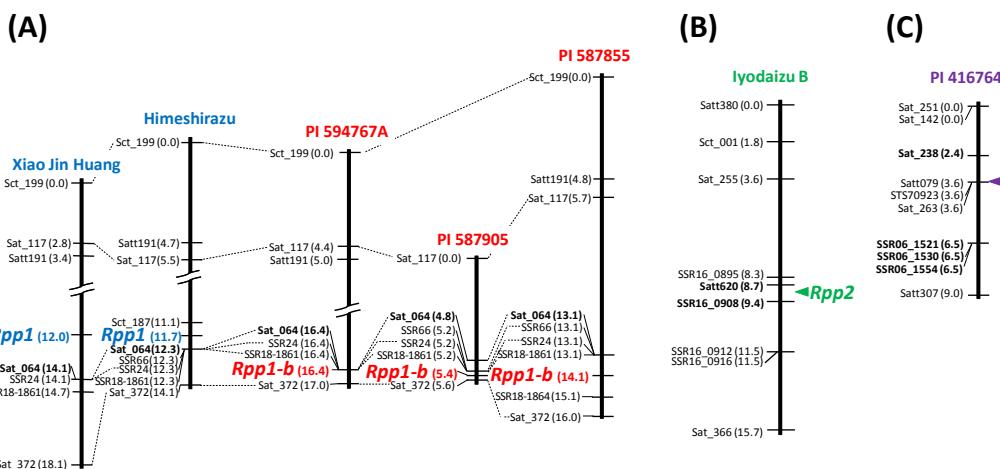


図1 大豆7品種のさび病抵抗性遺伝子座*Rpp1*と*Rpp1-b* (A)、*Rpp2*(B)、*Rpp3*(C) *Rpp2*と*Rpp3*は夏孢子生産量のQTL解析による。各連鎖群の左にDNAマーカー名と各連鎖群の先頭からの遺伝的距離(cM)を示す。

Fig. 1. ASR resistance loci: *Rpp1* and *Rpp1-b* (A), *Rpp2* (B), and *Rpp3* (C). *Rpp2* and *Rpp3* were determined by QTL analysis for sporulation level. Names of markers and genetic distance (cM) from top of the linkage groups are shown on the left of each linkage group.

表1 大豆7品種の持つ抵抗性遺伝子の南米及び日本のさび病菌に対する反応

Table 1. Reactions of seven ASR-resistance soybean varieties to ASR pathogens from South America and Japan

| Soybean variety | Gene | Highly virulent Brazilian ASR pathogen | | | | Japanese ASR pathogen | | Frequency of resistant phenotype to 64 pathogens from South America and Japan |
|-----------------|---------------|--|---------|---------|---------|-----------------------|---------|---|
| | | BRP-2.49 | BRP-2.1 | BRP-2.6 | BRP-2.5 | T1-2 | E1-4-12 | |
| Xiao Jin Huang | <i>Rpp1</i> | S | S | S | S | R | SR | 9.7 - 16.1%* |
| Himeshirazu | <i>Rpp1</i> | S | S | S | S | S | HR | 9.7 - 16.1%* |
| PI 594767A | <i>Rpp1-b</i> | HR | HR | HR | S | HR | HR | 96.5% |
| PI 587905 | <i>Rpp1-b</i> | HR | HR | R | S | R | HR | 84.1% |
| PI 587855 | <i>Rpp1-b</i> | HR | R | HR | S | - | HR | 78.6% |
| Iyodaizu B | <i>Rpp2</i> | R | SR | S | S | S | HR | 25.8 - 31.8%* |
| PI 416764 | <i>Rpp3</i> | S | S | S | S | R | HR | 34.4% |

HR: Highly resistant; R: Resistant; SR: Slightly resistant; S: Susceptible; -: No data.

*The ranges of frequencies shown here are based on different varieties but carrying 366 either *Rpp1* or *Rpp2*.

