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[\[PDF \(573K\)\]](#) [\[References\]](#)**Molecular Structures and Some Properties of Rice Starches from Hokkaido Cultivars**Toshinari Igarashi¹⁾, Isao Hanashiro²⁾ and Yasuhito Takeda²⁾

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The molecular structures and some properties of starches of Hokkaido rice (Hoshinoyume, Kirara 397 and Aya) were examined and compared with Akita rice (Akitakomachi). The Hokkaido cultivars showed a Ca type of X-ray diffraction pattern, and Akitakomachi showed an A type. The actual amylose contents of Hoshinoyume and Kirara 397 were 18%. Pasting properties determined with RVA showed that Hoshinoyume and Kirara 397 had smaller maximum viscosity than Aya and Akitakomachi, and smaller breakdown and higher setback than Akitakomachi. Iodine affinity of amylose in Hoshinoyume and Kirara 397 was almost 19. The average degree of polymerization (DP_n) showed that Hoshinoyume and Kirara 397 (-900) were similar to Akitakomachi, and smaller than Aya (-1000). The average number of chains was 2-3. The molar-based distribution of the three Hokkaido varieties was wider than for Akitakomachi. The iodine affinity of the amylopectin of Hoshinoyume and Kirara 397 was 2.5 times higher than for Aya and Akitakomachi. The DP_n of Akitakomachi (9400) was the biggest, and of Aya (7600) was the smallest. The average chain lengths of the Hokkaido varieties are 1-2 residues shorter than Akitakomachi. The β-amylolysis limit was a little higher than that of Akitakomachi. The amylopectin super-long chain contents of Hoshinoyume and Kirara 397 were about 3.5 times higher than for Akitakomachi. From these results, it was concluded that in terms of eating qualities of cooked rice, Aya has better ones than the other Hokkaido cultivars because of its lower apparent amylose content and consequently, lower setback even though the setback of Aya was still slightly higher than that of Akitakomachi. Thus, besides amylose content, the amylose molecular weight distribution and the amylopectin chain-length distribution

appeared to be factors affecting starch pasting properties, suggesting that the molecular structure, especially the super-long chain content of amylopectin, should be paid more attention in rice breeding for better eating quality.

Key words: rice, amylose, amylopectin, pasting properties

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