

Jidapa Moongkanna 2011: Molecular Markers Identifying Genes Controlling Certain Fatty Acids in Soybean (*Glycine max* (L.) Merr.). Doctor of Philosophy (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Professor Peerasak Srinives, Ph.D. 132 pages.

Soybean is an economic crop used as a main source of vegetable oil. Quality and quantity of oil in soybean seed is important as a raw material determining manufacturing cost. Oil quality is judged from its fatty acid composition which may affect human health. Assessment of oil quality in a breeding program is expensive and time-consuming, thus it is useful to identify molecular markers linked to genes controlling oil content and synthesis of certain fatty acids. The linked markers would be helpful in selection of soybean lines for fatty acid traits. The aim of this research was to develop molecular markers linking to genes controlling seed traits and total oil content in soybean. To identify the markers, an F<sub>2:3</sub> population comprising 186 families was developed from a cross between Pak Chong 2 and Laos 7122. The population was genotyped by 159 polymorphic SSR markers, and seeds were determined for oil content by hexane extraction method and fatty acid profile by gas chromatography. QTL analysis was done by a simple regression method and composite interval mapping. The results revealed that, from 159 polymorphic markers, 138 were grouped into 30 linkage groups, covering 1,921.1 cM of soybean genome, and 21 remained unlinked. There were 20 putative QTLs locating on 7 linkage groups including A1, C2, D2, E, G, H and O that found associating with number of nodes on main stem per plant, seed length, seed width, 100-seed weight, total oil content, percentages of palmitic, stearic, oleic, linoleic and linolenic acids.

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