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Dynamic selection during soybean domestication

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Soybean [*Glycine max* (L.) Merr.] was domesticated in East Asia from the wild progenitor *Glycine soja*. The domestication process led to many distinct morphological changes that adapt it to cultivation. These include larger and impermeable seeds, erect growth, larger stem diameter, reduced pod shattering, and altered growth habit. By a combination of QTL mapping and candidate gene approaches, we have recently mapped and/or fine-mapped QTLs underlying these domestication-related traits, and several QTLs have been isolated and functionally verified. We found that the transition from indeterminate to determinate soybeans was resulted from independent selection of four individual point mutations and that the transition from impermeable to permeable seed coat has undergone recurrent selection due to introgression/gene flow between the wild and cultivated soybeans as well as de-domestication. In addition, intended selection of favorable traits was often accompanied by unintended selection of other traits due to selective sweep or pleiotropy. These observations demonstrate that although the single origin of the cultivated soybeans, the domestication process was rather dynamic and complex.