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Comparative analysis of two Alfalfas (*Medicago sativa* L. and *M. falcata* L.) using SSR, EST-SSR and morphological traits

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Key words: *medicago sativa* L., *medicago falcata* L., morphology, SSR, EST-SSR

Introduction *Medicago sativa* L. is one of the most important forage in China. *M. falcata* is an important species for alfalfa breeding because it has high resistance to cold and drought. Chinese alfalfa breeders have bred some varieties using *Medicago sativa* L. crossing with *M. falcata*. But there is no any knowledge of genetic distance on the two species till now, which limits further breeding. The molecular marker technique has been used for analysis of the genetic diversity of alfalfa (Li, 1998). In this paper, we compared the genetic distance of different alfalfa varieties using the morphological character and molecular marker technique such as SSR and EST-SSR, which can provide guidance for alfalfa breeding.

Materials and methods Select 24 alfalfa varieties (including 21 *sativa* varieties and 3 *falcata* lines) in field. We measure the morphological character which related with biomass including the branch number, nod number, leaf area and etc. in the period of the first cutting in July. We select the healthy leaves in May and extracted DNA to analyse the SSR and EST-SSR.

Results Morphological distance (the squared Euclidean distance) is larger in different varieties, the two lines from Xinjiang are one group, the other varieties are another group. The genetic distance has small distance among different varieties using SSR and EST-SSR molecular marker, but the lines from Xinjiang has larger distance with the other varieties. *M. sativa* has significant different distance with *M. falcata* from Xilinguole league, but both have no significant different distance measured by morphological traits.

Conclusion The distance has some difference between measured using morphological traits and the SSR, EST-SSR, But the SSR and EST-SSR could differentiate *M. sativa* and *M. falcata*.

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Reference

Li Yongjun, Su Jiakai. Study on the genetic diversity of alfalfa local varieties (*Medicago sativa* L.) based on RAPD markers [J]. *Acta Agraria Sinica*, 1998, 6(2): 105-114.