

Genetic diversity of Brachiaria grass in East Africa as revealed by single sequence repeat (SSR) markers

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Project summary

Forages are important source of livestock feed that contribute up to hundred percent of livestock daily diets. Brachiaria is one of the most important tropical forages supporting millions of livestock in tropical Americas, Australia and Asia with acreages of over 99 million hectare in Brazil alone. All currently available improved Brachiaria varieties have narrow genetic base and were developed outside Africa in the absence of natural pests and diseases. The durability or productive life of these improved varieties is questionable especially when they are grown in native home Africa and face the native pests and diseases. Therefore, this study aims to understand genetic diversity of Brachiaria germplasms (both local ecotypes and genebank accessions) that originate from East Africa and determine their utility in the Brachiaria improvement program.

Outputs

- A total of 363 Brachiaria germplasm consisting of local ecotypes from Uganda, and genebank accessions collected during 1980s from Ethiopia and Tanzania and maintained at ILRI Ethiopia field genebank were included for genotyping. It will add on the previous work on local Brachiaria ecotypes from Kenya and Rwanda (Fig. 1)
- DNA was extracted from all 363 germplasm, PCR reaction were performed using 24 SSR markers and PCR products are currently being genotyped at BecA-ILRI Hub.
- Genotyping results are available for some of the germplasms and data cleaning and formatting is under way.



Fig. 1 Brachiaria collections from East Africa countries

Outcomes

- The genetic diversity of Brachiaria local materials from the East African countries will be documented. This information would be basis for the Brachiaria improvement and breeding programs for Africa and other parts of the world.
- Some East African NARS are already engaged in phenotypic characterization of local Brachiaria germplasm. The phenotypic information when combined with SSR data will help to identify parents for improving Brachiaria for specific traits e. g. drought tolerance, pests and diseases resistance and adaptation to low fertility soils.

Partnerships

1. National Livestock Resources Research Institute (NaLIRRI), Uganda
2. Tanzania Livestock Research Institute (TALIRI), Tanzania
3. Ethiopia Institute of Agricultural Research (EIAR), Ethiopia
4. Bioscience eastern and central African (BecA Hub)

Potential to scale-up

- Forages are increasingly important in Africa to support booming livestock industry. Brachiaria has shown a great potential in East Africa to produce high amount of high quality biomass, and shown significant improvement in livestock productivity.
- Information generated from this study will be basis for Brachiaria improvement for broadening genetic base and developing cultivars for specific traits.

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