1641 (O-26)

Effective Utilization of Local Genetic Diversity of Pigeonpea, Sorghum and Finger Millet in Eastern and Southern Africa: Impacts and Prospects

N.V.P.R. Ganga Rao[1], Eric Manyasa[1], Ojulong Henry[1], Moses Siambi[1] and H.D. Upadhyaya[2]

[1]International Crops Research Institute for the Semi-Arid Tropics, Eastern and Southern Africa Region, Nairobi, KENYA
[2]International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Hyderabad, INDIA
n.gangarao@cgiar.org

Eastern and Southern Africa (ESA) is the centre of genetic diversity for pigeonpea, sorghum and

Finger millet. ICRISAT regional bank located in Nairobi-Kenya maintains about 6000 germplasm accessions that are of greater use in ESA. ICRISAT-Nairobi is regularly collecting local diversity existing in the region and thus collected germplasm characterized/evaluated to identify locally adapted germpalsm with highly desirable traits. Local diversity captured in ESA has unique traits with respect to local agro-ecological adaptation, farmer and consumer preferred grain traits, tolerance to drought and region specific diseases. ESA regional germplasm also contributed to global genetic diversity maintained ICRISAT-Patancheru in several ways. During recent years 30 new varieties of pigeonpea (8), sorghum (10) and Finger millet (12) were released in eight ESA countries and occupying huge area in respective countries. Pigeonpea is an example crop with great success recorded during last 15 years when breeding program started using local germplasm. Pigeonpea improvement in ESA started in 1992 by mostly relying on native germplasm and through this 33 high yielding varieties that are belonging to short(8), medium(13) and long(12) maturity group were released. A strong region specific genetic enhancement program is in operation with major breeding thrust on high grain yield, inter-cropping compatibility, photo-period insensitivity, grain quality, resistance and/or tolerance to *Fusarium* wilt and *Helicoverpa* pod borer and resilience to climate change. Most of the cultivated germplasm is susceptible to insects but regional germplasm contributed develop that are insect-cum-drought tolerant, high yielding and big seeded (28 g/100 seed mass). ESA region has huge untapped potential with respect to genetic diversity and its use in genetic enhancement.

Keywords: Eastern and Southern Africa, Genetic diversity, Genetic enhancement

1720 (O-27)

Indian Edible Oyster, a Promising Bivalve for Aquaculture amidst the Challenges of Climate Change as Revealed Through Thermo Tolerance Studies

M.P. Paulton[1], P.C. Thomas[1] and A. Gopalakrishnan[1]

[1]ICAR-Central Marine Fisheries Research Institute, P.B. No. 1603, Kochi - 682018, INDIA
meleth_paulton@yahoo.co.in

Temperature tolerance of a species is an indicator which determines its potential to persist or become extinct in response to climate change and related environmental challenges. Aquaculture of the Indian edible oyster (*Crassostrea madrasensis*) is becoming more popular along the Indian coasts. Hence, knowledge on the level of thermo tolerance and the molecular mechanism behind it shall be of immense use for the scientific management of the system to ensure sustainable production. The oysters collected from the oyster farm were acclimated in aerated sea water. Sub lethal temperature (SLT) and lethal temperature (LT) were determined as 44˚C and 47˚C respectively by exposing the acclimated oysters to temperatures ranging from 37˚C to 47˚C and monitoring the survival in normal temperature (28˚C). Transcriptomic analysis of oysters recovering from SLT has shown a statistically significant up regulation of genes coding for heat shock protein 70 (Hsp70) and super oxide dismutase (Cu/Zn SOD). The oysters recovering from sub lethal shock (SLT) were found to be resistant to the subsequent lethal temperature (LT) shock while the control animals not exposed to SLT succumbed to death. The phenomenon of induced tolerance was evident and the oysters survived LT up to of 26 days which stands as record duration ever reported. The study has revealed the special potential of Indian edible oyster in thermo tolerance over its western counter parts Thus the Indian edible oyster could be projected as a winner species with the ability to survive the challenges posed by climate change.

Keywords: Oyster, Thermo Tolerance, Winner Species