Indian J. Plant Genet. Resour. 34(1): 90–92 (2021)
DOI 10.5958/0976-1926.2021.00015.2

SHORT COMMUNICATION

Profiling Total Phenolic Content of Different Seed Coloured Germplasm of Ratti (*Abrus precatorius*)

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(Received: 18 May, 2020; Revised: 9 April, 2021; Accepted: 9 April, 2021)

Abrus precatorius is a medicinal plant belonging to the family Fabaceae. The main biochemical constituent responsible for its medicinal value is abrin, a protein. The plant is native to India and has been used in the traditional medicinal system for the treatment of wide range of diseases. *Inter alia*, anti-oxidant activity is important since phenolic compounds play a crucial role in free radical scavenging. Ninety-nine accessions of *Abrus precatorius* from National Genebank at NBPGR were profiled for total phenolic content by folin ciocalteu reagent. IC0311747 (a completely white seeded accession) contained the lowest total phenolic content of 16.115 mg/g whereas IC0605143 (a completely black seeded accession) contained the highest total phenolic content of 44.637 mg/g.

Key Words: *Abrus precatorius,* Indian liquorice, Medicinal plant, Ratti, Total phenols

Introduction

Abrus precatorius is a popular medicinal herb also known as Indian licorice/Crabs eye/Coral bead/Ratti/Gunja belonging to family Fabaceae. The plant originated in South-East Asia (Okhale and Nwanosike, 2016) but is profusely found in Subtropical areas of the world. In India, the plant was widely distributed up to 1200m in the outer Himalayas and downwards to Southern India (Das *et al*., 2016). Its uses are well documented for siddha medicines in Tamil Nadu (Ghosh *et al.,* 2007). It is a perennial herb with variation in seed colour from black and red to white and grey combination. The biochemical constituents of *Abrus precatorius* seeds include abrin, abrol, abrasine, pre-casine and precol. Even a very small quantity of abrin (0.00015% of the compound) can be lethal (Lalithakumari *et al.,* 1971). Recently, Glycyrrhizin, a main component of *Abrus precatorius,* was shown to inhibit 6LU7 protein (COVID-19 enzyme responsible for replication of coronavirus in human body) and protease inhibitor responsible to affect coronavirus replication (Oladimeji, 2020).

National Genebank located at ICAR-NBPGR conserves 152 accessions (as on April, 2021) of *Abrus precatorius* collected from various wild habitats across the country particularly from Kerala and Odisha (18%). Phenolic compounds are secondary metabolites which are known to have wide range of functions in plants. Their functions includes antioxidant activity, free radical scavenging, singlet oxygen quenching, metal chelation, reducing activity etc. Here we report profiling of 99 *ratti* germplasm accessions for total phenolic content.

Materials and Methods

Seeds were collected from the germplasm accessions grown at NBPGR Experimental Farm, Issapur (Fig. 1). Total phenolic content was estimated by folin ciocalteu reagent. About 0.1g of ground *ratti* seed sample was taken in a 15ml centrifuge tube. Then 5 ml of 80% ethanol was added into the tube. After mixing it by vortexing, the tube was incubated in boiling water for 30 min. Cooled down contents were centrifuged at 10K rpm for 10 min. Transfer the supernatant to a new labelled centrifuge tube. From the residue, re-extraction was done by adding 5ml of 80% ethanol. Finally, the volume of pooled supernatants was made up to 10 ml using 80% ethanol. Dried 0.1ml extract was dissolved in 3ml of water and 0.5 ml of folin ciocalteu reagent was added followed by

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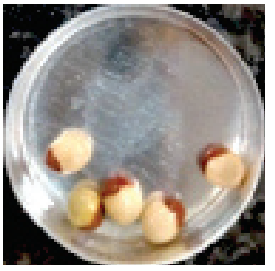
Fig. 1. Inflorescence of *Abrus precatorius* (IC400492) and seeds of IC 0310647 (Location: NBPGR Experimental Farm, Issapur)

2ml of 20% Na_2CO_3 and mixed by using vortex. After an hour, using the spectrophotometer, the absorbance was recorded at 650nm against the blank. The standard curve was drawn using the different concentrations i.e. 10, 20, 30, 40 and 50 µg/ml of gallic acid.

Results and Discussion

Seed colour as well as phenolic content exhibited variation among 99 accessions (Table 1). Total phenolics ranged from 18.568 mg/g complete white coloured accessions to 42.472 mg/g in complete black coloured accessions. IC311747, a complete white coloured accession, had the lowest total phenolic content of 16.115 mg/g whereas IC605143, a complete black coloured

Table 1. Phenolic range and mean of different seed coloured *ratti* accessions

Seed colour class	Image	Phenolic range (mg/g)	Mean (mg/g)
Complete white		16.115 to 21.337	18.568
Pink + brown		22.929 to 23.218	23.073
Cream + brown		23.266 to 23.958	23.689
Red + black		23.921 to 30.553	27.704
Complete black		39.213 to 44.637	42.472

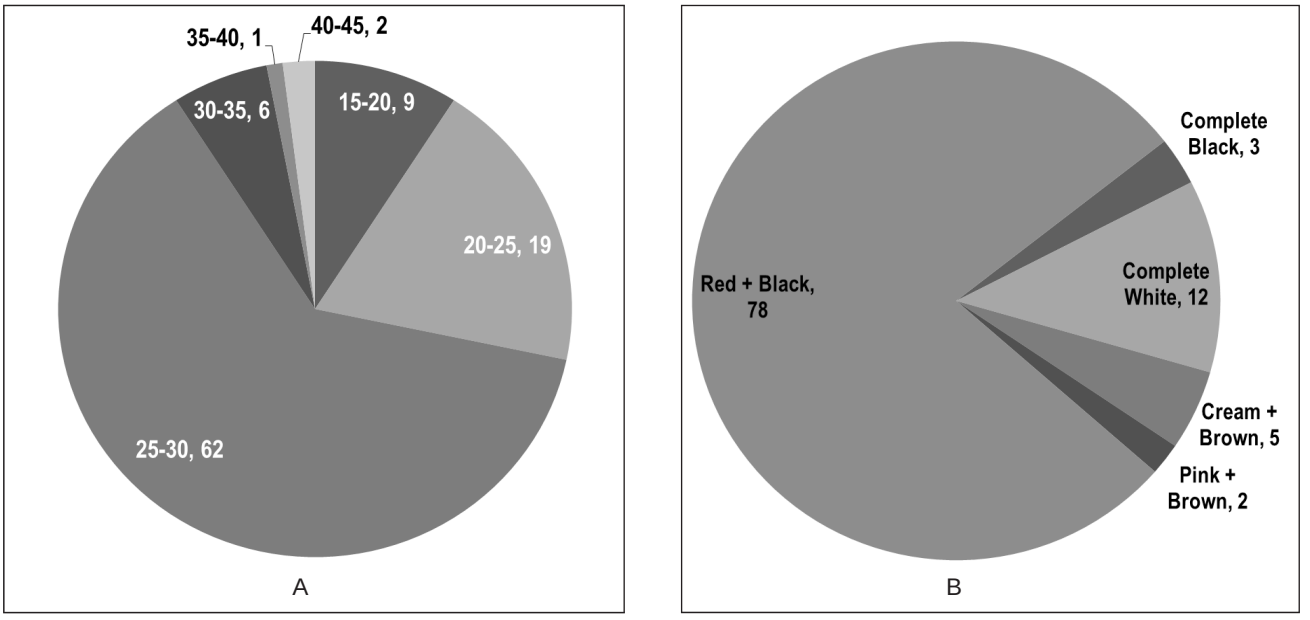


Fig. 2. (A) Variation in total phenolics (expressed in mg/g) and corresponding number of accessions; (B) Variation in seed colour and corresponding number of accessions among 99 ratti accessions profiled.

accession, had the highest total phenolic content of 44.637 mg/g. Maximum number of accessions bore red + black seeds (78) and most accessions (62) contained phenolics in the range of range of 25-30 mg/g (Fig. 2).

Variation in the phenolic content and seed colour indicate excellent variation that can be expected in *Abrus precatorius* accessions conserved in the genebank. However, detailed biochemical profiling for protein, saponins, antioxidants, oil extract, flavonoids and tannins can provide a better insight. Genetic diversity at DNA level can answer if the accessions collected from various locations are diverse within and across seed colour.

Acknowledgements

This work was carried out as part of Ph.D. (Plant Genetic Resources) thesis work of S. Prabakaran. Authors acknowledge the ICAR-IARI and ICAR-NBPGR for providing the facilities.

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