International Journal of Chemistry Studies
ISSN: 2581-348X
Impact Factor: RJIF 5.44
www.chemistryjournal.in
Volume 2; Issue 3; May 2018; Page No. 37-38

Effect of Seed Priming on Biochemical traits of Maize (*Zea mays* L.)

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Abstract
Objective of this study to assess the influence of seed priming on biochemical traits of maize (*Zea mays* L.). The experiment was carried out during kharif 2016 at research Farm JNKVV, Jabalpur (MP) which was laid out in a randomized block design replicated thrice. The treatments comprised of nine seed priming treatments in maize CV, African tall viz., water, $ZnSO_4$ @ 0.5%, KNO_3 @ 0.5% &KH_2PO_4 @ 0.5% for 6 and 12 hrs and control which were assessed for biochemical studies. The seed priming treatments showed variable response for most of the traits. Water primed for 12 hrs indicated the highest values for protein (10.51%), fat (3.34%) and ash (1.77%). KNO_3 for 12 hours showed high values for crude fiber (6.07%) and carbohydrates (73.46%).

Keywords: maize (*Zea mays* L.), seed priming, biochemical traits

Introduction
Maize (*Zea mays* L.) is one of the most important cereal crops in the world and is third important position in India after rice and wheat with enormous role in food and nutritional security. Maize is having special significance because in addition to staple food for human being and quality feed for animal, contains about 9.9 protein, 4 oil, 70 starch and 2.7 % crude fibre. It serves as a basic raw material as an ingredient to thousands of industrial products that include starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceutical, cosmetic, film, textile, gum, package and paper industries etc.
Maize has hundreds of uses. The kernel contains about 77 per cent starch, two percent sugar, nine percent protein, five percent oil and 2 percent ash on a water-free basis. The ash of the kernel contains salts of calcium, magnesium, phosphorus, aluminium, iron, sodium, potassium and chlorine. Maize is used primarily as a food for humans in most areas of the world, in contrast to the United States where about 85 per cent of the crop is used as cattle feed. Exogenous application of GB ameliorated the adverse effects of water stress with a subsequent increase in all these seed parameters both under stress and under non-stress conditions (Ali and Ashraf, 2011) [2]. The maximum crude fiber contents were observed in seed treated with KNO_3 (33.25%) which was 31% higher as as well as yield by studying priming effect on seed compared to control (Ali *et al*., 2016) [1].

Material and Methods
The present investigation was carried out during the Kharif 2016. The experiment was carried out at Research Farm, AICRP on FORAGE CROPS, Department of Agronomy, JNKVV, Jabalpur (M.P.). The experiment conducted in randomized block design with three replications having 9 treatments. The observations were recorded on five randomly selected plants from each plot and from each replication for the desired characters.

Results and Discussions
It has been recorded from the table1 that water primed for 12 hours showed significantly maximum in protein (10.51 %), fat(3.34%) and ash (1.77%). KNO_3 for 12 hours showed high values for crude fiber (6.07%) and carbohydrates (73.46%). Control had minimum values for all these traits.KNO_3 treatment can be used for drought conditions as it had highest fiber content. The maximum starch content was found with KNO_3 followed by KCl, GA_3, cycocel and hydropriming as compared to untreated control. Increase in starch content might be due to induced hydrolysis of reserve polysaccharide or rapid utilization of total soluble starch (Kalpana *et al*., 2013) [5]. Ali and Ashraf (2011) [2] reported that water stress reduced the kernel sugar, oil, protein, moisture contents and most of the seed micro- and macro-nutrients analyzed for both maize cultivars, but it increased the contents of seed fiber and ash contents. Hydro-priming results in better growth, a plant system protection against tension and increase in oil amount. Priming enhanced the seed germination through protein synthesis, repair of nucleic acid and membranes (Fujikura and Karssen,1995). The low oil percentage due to water deficit may be resulted from the short grain filling duration (Ghassemi-Golezani and Lotfi, 2013) [4]. The maximum crude fiber contents were observed in seed treated with KNO_3 (33.25%) which was 31% higher as as well as yield by studying priming effect on seed compared to control (Ali *et al*., 2016) [1].

Table 1: Effect of seed priming in biochemical constituents in maize

T No.	Seed priming treatments	Protein (%)	Total Crude Fiber (%)	Carbohydrates (%)	Fat (%)	Ash (%)
T_1	H_2O for 6 hours	9.49	6.07	68.37	3.34	1.50
T_2	H_2O for 12 hours	10.51	5.80	73.46	3.33	1.77
T_3	$ZnSO_4$ @ 0.5 % for 6 hours	10.51	6.07	63.45	3.34	1.50
T_4	$ZnSO_4$ @ 0.5 % for 12 hours	8.67	4.90	62.42	3.27	1.63
T_5	KNO_3 @ 0.5 % for 6 hours	8.01	5.30	71.18	3.05	1.47
T_6	KNO_3 @ 0.5 % for 12 hours	8.38	4.80	71.05	2.99	1.61
T_7	KH_2PO_4 @ 0.5 % for 6 hours	7.98	5.70	65.73	3.12	1.43
T_8	KH_2PO_4 @ 0.5 % for 12 hours	6.32	4.30	67.56	3.01	1.27
T_9	CONTROL	7.21	5.10	60.04	3.03	1.52
SEm ±		0.01	0.05	0.49	0.09	0.09
CD 5%		0.02	0.160	1.48	0.27	0.28

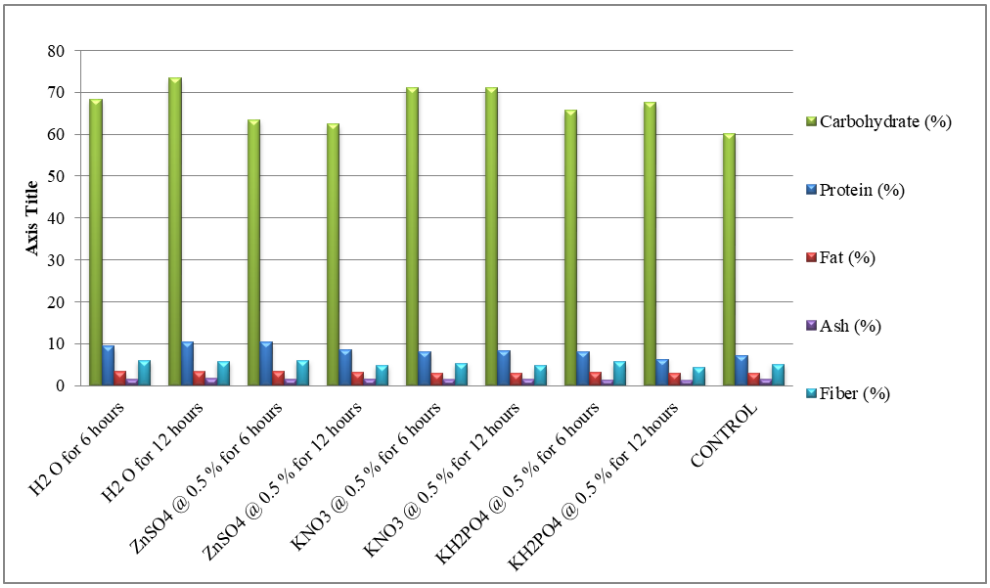

Fig 1: 14 Effect of seed priming on maize biochemical constituents

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