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A COMPARATIVE STUDY ON ZINC FERTILIZER BRANDS AVAILABLE IN THE MARKETS OF JESSORE REGION

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Abstract

A study was conducted in Monirampur upazila under Jessore district from July to December, 2016 to collect information on names, numbers and comparative availability of different brands of Zinc fertilizers in order to aid the assessment of nutrient status for quality of the brands. For this purpose, information was collected from 54 randomly selected fertilizer shops (20 BCIC fertilizer dealers and 34 retailers) through questionnaire interview. In the study total 77 brands [41 Zinc sulfate (mono), 11 Zinc sulfate (hepta) and 25 Chelated zinc] of zinc fertilizer marketed by 49 companies were found in the upazila. Zingsul, Mim zinc, Grogin, Bumper mono zinc, Eon zinc and Geel mono of Zinc sulfate (mono) brands, Topaz of Zinc sulfate (hepta) brands and Mim zinc gold of Chelated zinc brands were mostly available. "Grogin" of Zinc sulfate (mono) and "Topaz" of Zinc sulfate (hepta) were the top most available. Ten percent of Zinc sulfate (hepta) mentioned no registration number. There was a significant difference between highest and lowest MRP of all types (imported, supplied and manufactured) of Zinc sulfate (mono) and Zinc sulfate (hepta) fertilizer as well as imported Chelated zinc brands.

Keywords: Zinc, Fertilizer, Brand Name, Jessore

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Introduction

We need to keep our soils healthy and full of nutrients in order to feed the growing population of Bangladesh. However, our soil resource is being degraded for intensive cultivation of different crops. Use of organic and chemical fertilizer is increasing day by day in our modern agriculture. With the increased use of fertilizer, it is also required that a right quality of fertilizer is provided to the end user at affordable cost. However, adulteration of chemical fertilizer is being a great problem with time (SRDI, 2012). SRDI (2014) also reported that about forty per cent urea and non-urea fertilizers available in Bangladesh's market is adulterated and contains highest level of heavy metal that can cause serious health hazards to the people and affect food production and soil fertility in the long run. Moreover, by applying such contaminated fertilizers, farmers are cheated and production suffers. Seventy nine percent Zinc Sulfate (hepta hydrate) fertilizers are adulterated in Jessore region (Islam *et al.*, 2015a). Islam *et al.* (2016a) stated that hundred percent zinc sulfate (mono hydrate) fertilizers collected from Jessore, Jhenaidah and Chuadanga district were adulterated. Until now, at least 109 types of

chemical and organic fertilizers are approved by the Government of Bangladesh. Among them twenty four types are open for all and rests are assigned to particular private and non-government organizations for importing and manufacturing (BARC, 2006). BADC (2012) and BCIC (2013) reported that China, Qatar, Saudi Arab and Deshi types of Urea fertilizer; Cargill, Australia, China, Morocco and Deshi types of DAP; China, Tunisia, Morocco, Lebanon, Bulgaria and Deshi types of TSP, and Canada and Belarus types of MOP are available in domestic market of Bangladesh. In case of micro nutrient fertilizers, three categories of Zinc fertilizer viz. Zinc Sulfate (hepta hydrate), Zinc Sulfate (mono hydrate) and Chelated Zinc and three categories of Boron fertilizer viz. Boric acid, Solubor and Fertibor are approved by the Government (DAE, 2014). Many brand names of each of those categories are available in the market. More than 80 brands [41 Zinc sulfate (mono), 22 Zinc sulfate (hepta) and 17 Chelated zinc] of zinc fertilizer are available in Chuadanga region among which Grogin, Topaz, Zinc Sulfate, Mukta Plus, Zingsul, Hay Zinc+ of Zinc sulfate (mono) brands, Topaz and Petro zinc of Zinc sulfate (hepta) brands and Brexil, Field

Marshal, Topaz of Chelated zinc brands are mostly available (Islam *et al.*, 2015b). More than 42 brands (23 Solubor, 15 Boric acid and 4 Fertibor) of boron fertilizer are available in Chuadanga region among which Bingo, Solubor and Bor-Fa plus of Solubor boron brands, Mitrika boron and Alfa boron of Boric acid brands and Bor-Fa 15 of Fertibor (total six) brands are mostly available (Islam *et al.*, 2016b). It is necessary to know the comparative availability as well as the individual nutrient status for quality of different brands of three categories of Zinc fertilizer in order to take all types of fertilizer enterprises (manufacturer, supplier and importer) under quality control scheme to ensure the supply of quality fertilizers. However, there is no sufficient information about the definite number and name of brand of Zinc fertilizers available in a particular area of the country. Therefore, present study was conducted to find out how many and which brand of Zinc fertilizers are available in the markets of Jessore region and to compare the availability of those brands in order to aid the assessment of nutrient status for quality.

Materials and Methods

The present study was carried out in Monirampur upazila under Jessore district during the period from July to December, 2016 to collect the information on the availability of different brand name of Zinc fertilizers. For this purpose, investigations were conducted in eighteen points throughout the upazila that were considered as main bazar of seventeen union sadar and one pourashava. For that reason, information was collected from different fertilizer shops situated on those bazar points and surrounding the points. Three shops were randomly selected from each

union and pourashava. Thus, 54 fertilizer shops were taken under the study. There were twenty dealership of Bangladesh Chemical Industries Corporation (BCIC) distributed in the upazila. All BCIC fertilizer dealers were included in the study. Information on the number and name of brands of each category of Zinc fertilizer were recorded from each of fifty four shops by individual interview. Manufacturer's or supplier's name, Government registration number, maximum retail price (MRP) and date of expiry (DOE) of each brand were also recorded during interview. Data were collected through questionnaire interview. The questionnaire prepared in Bengali was designed with both closed and open form of questions. The collected data were coded, summarized and proceed for analysis. Qualitative data were converted into quantitative forms by means of suitable scoring technique whenever necessary. Tabulations and cross tabulations were done on the basis of categorization developed by the researcher. Tabular technique was applied for the analysis of data by using simple statistical tools like averages and percentages. Selected 54 shops were assumed as 54 attendances for each brand. One mark (score point) was given for each attendance in a shop against a brand and total score point (TSP) was calculated with the aggregate of the score points for the individual (i.e. TSP 2 means the brand was present in 2 shops out of 54 shops). TSP of a brand represented its degree of presence, which was treated as its availability. Then they were tabulated gradually from highest to lowest depending on their TSP. Finally, they were classified into following three classes depending on the availability.

Table 1. Availability class and their range of total score points (TSP) of different category of Zinc fertilizer.

Availability Class	Total score point (TSP) Obtained		
	Zinc sulfate (mono)	Zinc sulfate (hepta)	Chelated zinc
Most available: Class-I	>4	>4	>4
Moderately available: Class-II	2-4	2-4	2-4
Less available: Class-III	<2	<2	<2

Results and Discussion

Brand name and availability

Total 77 brands [41 of Zinc sulfate (mono), 11 of Zinc sulfate (hepta) and 25 of Chelated zinc] were found in the market of Monirampur upazila which were manufactured or marketed by 49 individual company. Table 2 shows the Brand names of different categories of zinc fertilizer including their availability class. In case of Zinc sulfate (mono), 6 brands included class-I among which both Zingsul and Mim zinc obtained the total score point (TSP) 16 and Grogin and

Bumper mono zinc obtained 12 points. Only Eon zinc obtained 10 points and only Geel mono obtained 8 points. This indicated that above mentioned six brands of Zinc sulfate (mono) were mostly available in the market among which the brand Zingsul (Registration number: IMP-30; marketed by Petrochem Bangladesh Ltd.) and Mim zinc (Registration number: IMP-912; marketed by Mimpex Agro Chemicals Ltd.) was the top most available brands. Five brands included class-II among which three brands America Zinc (IMP-4476), Krishak bondhu zinc and America Zinc (IMP-1734) obtained 4 points,

two brands Zinc plus and Mukta plus obtained 3 points and each of another twelve brands Topaz, Prime Zinc, Madhumati zinc, Hira zinc, American zinc plus, Dosta Raj, GME gold, Dolar zinc, Mac zinc, Eco zinc sulfate, Hay zinc +, Nafko zinc obtained 2 points. That means this 12 brands were moderately available in the market. The rest 18 brands under class-III [Eagle Zinc, Hiron zinc,

Grozinc (S-2238), China mono zinc, Shakti plus, New Shakti plus, Shakti one, Gold zinc plus, Top zinc, Sunrise zinc, Grozinc (IMP-1402), Special bumper falon, Nature care zinc, Zingro plus, Shaktiman, Gurhpukur, Wangsheng zinc] obtained 1 score point that were considered as less available.

Table 2. Brand names of different categories of zinc fertilizer including their availability class.

Category of Zinc Fertilizer	Availability Class	TSP	Name of brands	Number of brand		
Mono	Class-I	16	Zingsul, Mim zinc	02		
		12	Grogin, Bumper mono zinc	02		
		10	Eon zinc	01		
		8	Geel mono	01		
	Class-II	4	America Zinc (IMP-4476), Krishak bondhu zinc, America Zinc (IMP-1734),	03		
		3	Zinc plus, Mukta plus	02		
		2	Topaz, Prime Zinc, Madhumati zinc, Hira zinc, American zinc plus, Dosta Raj, GME gold, Dolar zinc, Mac zinc, Eco zinc sulfate, Hay zinc +, Nafko zinc	12		
		Class-III	1	Eagle Zinc, Hiron zinc, Grozinc (S-2238), China mono zinc, Shakti plus, New Shakti plus, Shakti one, Gold zinc plus, Top zinc, Sunrise zinc, Grozinc (IMP-1402), Special bumper falon, Nature care zinc, Zingro plus, Shaktiman, Gurhpukur, Wangsheng zinc	18	
			Class-I	5	Current Bumper	01
				4	Fresh zinc	01
Class-II	2	Krishak bondhu	01			
	Class-III	1	Shokti, Krishan-G, Moon Dosta, Surjomukhi Zinc gold, Eco Zinc, Geel, Topaz, Sunrise.	08		
		Class-I	12	Mim zinc gold	01	
Class-II	4		Geel Chelated	01		
	3		Century	01		
2	Charge, Glory gold, Chelamin, Chilakor		04			
Class-III	1	Chelay zinc, Add Cheli, Medina, Field marshal, Bumper Chela zinc, Zoar, Volt 707, Sunlit, Bicorel, Chelated zinc, Ready zinc, Mac chili, Os chili, China shaktiman, Librel zinc, Nature care, Topaz, Padma Chelate	18			

In case of Zinc sulfate (hepta), 1 brand "Current Bumper" included class-I which obtained highest 5 points. This indicated that this brand was the mostly available. Subsequently, "Fresh zinc" obtaining 4 points and Krishak bondhu obtaining 3 points under class-II were moderately available. In addition, another 8 brands (Shokti, Krishan-G, Moon Dosta, Surjomukhi Zinc gold, Eco Zinc, Geel, Topaz, Sunrise) under class-III were considered as less available brands. Further, in case of Chealed zinc, only the brand Mim zinc gold under class-I obtained 12 points and considered as most available. "Geel Chelated" obtaining 4 points, Century obtaining 3 points and four brands obtaining 2 points (Charge, Glory gold, Chelamin, Chilakor) under class-II were moderately available and rest 18 brands (Chelay zinc, Add Cheli, Medina, Field marshal, Bumper Chela zinc, Zoar, Volt 707, Sunlit, Bicorel, Chelated zinc, Ready zinc, Mac chili, Os chili, China shaktiman, Librel zinc, Nature care, Topaz, Padma Chelate) obtaining 1 score point might be considered as less available brands of

Chelated zinc fertilizer. Therefore, 8 brands [6 of Zinc sulfate (mono), 1 of Zinc sulfate (hepta), and 1 of Chelated zinc] were mostly available, 13 brands were moderately available and rest 56 brands were less available in the market of Monirampur upazila for farmers. So the quality of those brands obtained should be analyzed with great importance.

Maximum retail price (MRP)

Maximum retail price (MRP) of imported Zinc sulfate (mono) fertilizer varied from TK. 60 (Groginc; IMP-1402) to TK. 220 (Groginc; IMP-959 and Krishak bondhu zinc; IMP-471) per kg and that of supplied and manufactured one varied from TK. 80 (Special bumper falon; S-2459) to TK. 220 (Nature care zinc; S-397) and TK.70 (Sunrise zinc; M-1215) to TK. 180 (Shokti plus; M-264) per kg, respectively. All brands of Zinc fertilizer mentioned their MRP. Different brands of Zinc sulfate (hepta) ranged from TK. 38 (Moon Dosta) to TK. 180 (Current Bumper) per kg in their MRP among which imported, supplied and

manufactured fertilizer varied from TK. 110 (Krishak bondhu; IMP-481) to TK. 160 (Eco Zinc; IMP-1413), TK.38 (Moon Dosta; S-440) to TK. 180 (Current Bumper; S-2325) and TK. 45 (Sunrise Zinc; M-93) to TK. 140 (Shakti ; M-484) per kg, respectively. In case of Chelated zinc, 24

brands were imported and only one was supplied. Their MRP varied from TK. 1400 (Padma Chelate; IMP-5368) to TK. 5500 (Bicorel; IMP-3581) per kg fertilizer (they were available in 10,17,20,25 and 50 gram packet).

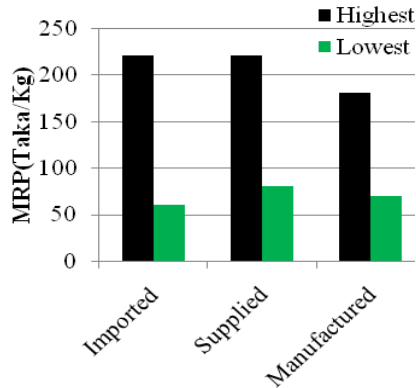


Fig.1: Highest and lowest MRP of Zinc Sulfate (mono).

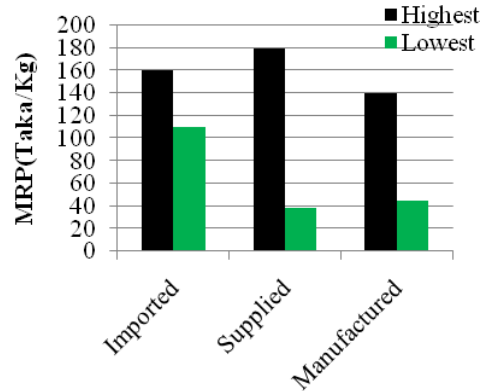


Fig.2: Highest and lowest MRP of Zinc Sulfate (hepta).

There was a mentionable difference between highest and lowest MRP of all types (imported, supplied and manufactured) of Zinc sulfate (mono) fertilizer (Fig. 1). Highest price was 267% more for imported, 175% more for supplied and 157% more for manufactured type than lowest price. Lower MRP of same type of product might result adulteration. In case of Zinc sulfate (hepta), a mentionable difference was observed between highest and lowest MRP of imported (highest was 45% more than lowest) and a wide difference was observed (Fig. 2) in both supplied (highest was 374% more than lowest) and manufactured type (highest was 211% more than lowest). Further, a far difference (293%) was conspicuously observed in highest and lowest MRP of imported types of Chelated zinc (Fig. 3). No sample of manufactured type and only one sample of supplied type of Chelated zinc was found. According to Government specification of fertilizer, Zinc sulfate (mono), Zinc sulfate (hepta) and Chelated zinc must have minimum

36, 21 and 10 percent total zinc, respectively. It is also mandatory to have minimum 17.5% sulfur in Zinc sulfate (mono) and 10.5% sulfur in Zinc sulfate (hepta). Chelated is Sulfur free fertilizer and it is used as foliar spray which is more useful for plant (BARC, 2012). Fig. 4 shows the comparative average MRP of different types (imported, supplied and manufactured) of Zinc sulfate (mono), Zinc sulfate (hepta) and Chelated zinc. In case of Zinc sulfate (mono) committed to have 36% Zn and 17.5% S, average MRP of imported, supplied and manufactured type were 184, 152 and 133 taka per kg, respectively. On the other hand, in case of Zinc sulfate (hepta) committed to have 21% Zn and 10.5% S, MRP of those were 127, 114 and 95 taka per kg irrespective of three types. However, that price of Chelated zinc was 2,693 taka per kg that was very much absurd and such higher price perhaps might be for its distinction. Therefore, their chemical analyses for quality are very important to see the actual scenario.

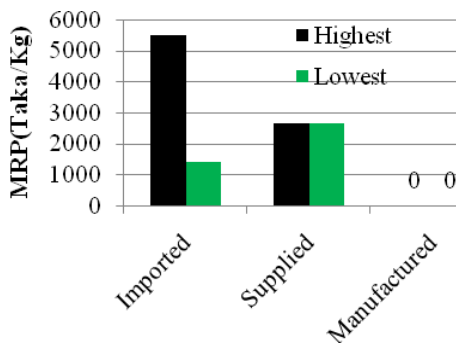


Fig.3: Highest and lowest MRP of Chelated Zinc.

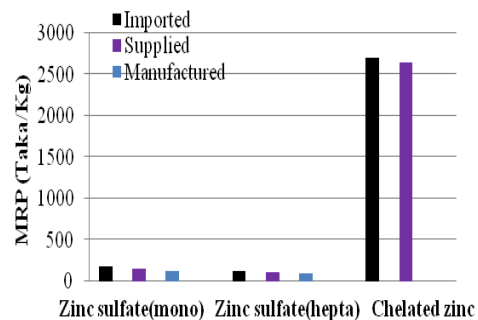


Fig 4. Comparative MRP of different types of Mono, Hepta and Chelated Zinc fertilizer

Registration features

Total 77 brands of zinc fertilizer were found in the upazila. Three types of registration number were observed against the brands mentioned on their packets. They were namely "IMP", "S" and "M" type. According to registration certificate issued by the Govt., "IMP" means imported from abroad, "S" means supplied by purchasing from importer or manufacturer and "M" means manufactured locally in their own factory (DAE, 2014). Ten percent of Zinc sulfate (hepta) mentioned no registration number. However, all the brands of Zinc sulfate (mono) and Chelated zinc mentioned their registration numbers. Two samples (Chelamin and Geel Chelated) out of twenty five

mentioned the same registration number (IMP-4053). Fig. 5 shows that 83% of mono brands were imported, 10% were supplied and 7% were manufactured types. In case of Zinc sulfate (hepta) brand, 36% were imported and each of supplied and manufactured types occupied 27% but 10% were registration less (Fig. 6). Ninety six percent Chelated zinc brands imported type registration number, which were imported from abroad by twenty four different companies. Only 4% of them were supplied type (Fig. 7). The brands without any registration number might be adulterated. Therefore, category wise quality analysis of zinc fertilizer is necessary.

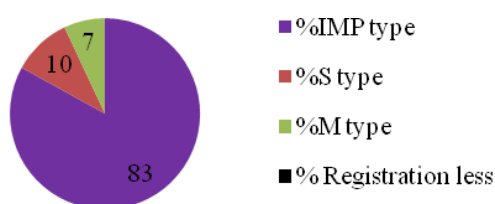


Fig.5: Relative proportions of different types of registration number in Zinc sulfate (mono)

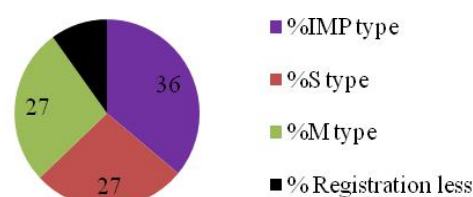


Fig.6: Relative proportions of different types of registration number in Zinc sulfate (hepta)

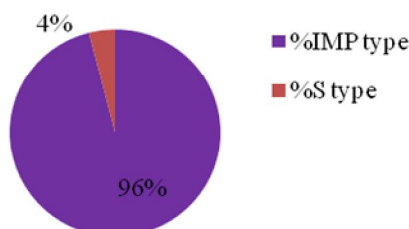


Fig.7: Relative proportions of different types of registration number in Chelated Zinc

Company characteristics

Forty nine companies marketed seventy seven brands of zinc fertilizer. Forty one brands of Zinc sulfate (mono), eleven brands of Zinc sulfate (hepta) and twenty five brands of Chelated zinc were marketed by 38, 10 and 25 companies respectively. In case of Zinc sulfate (hepta), additional three companies were found over Zinc sulfate (mono) companies. Further, additional eight companies were found over forty one of Zinc sulfate (mono) and Zinc sulfate (hepta) company in case of Chelated zinc. Each of M/S A R Agro Chemical, Jessore (Madhumati zinc; IMP-1189 and American zinc plus; S-1139), Gurhpukur Corporation Ltd. (Dosta Raj; IMP-5629 and Gurhpukur; IMP-4855) and High Care Agro science, Dhaka (Gold zinc plus; IMP-5675 and Top zinc; IMP-4627) marketed two Zinc sulfate (mono) brands using different registration number. Accordingly, M/S. Trade marketing

company Ltd., Dhaka marketed both Fresh zinc (S-2233) and Current Bumper (S-2325) brand of Zinc sulfate (hepta). Except that, each company marketed only one individual brand. All the companies were of several types depending on their address. Ninety six percent were of Dhaka based and Four percent were of out of Dhaka based among which each of Jessore and Jhenaidah was two percent. Among the companies, 55% marketed only one category of zinc fertilizer [37% company provided only Zinc sulfate (mono), 2% provided only Zinc sulfate (hepta) and 16% company provided only Chelated zinc]. On the other hand, 41% company marketed two categories [Zinc sulfate (mono) and Zinc sulfate (hepta) 10%, Zinc sulfate (mono) and Chelated zinc 27% or Zinc sulfate (hepta) and Chelated zinc 4%] and 4% companies marketed all three categories of zinc fertilizer.

Conclusion

Total seventy seven zinc fertilizer brands manufactured or marketed by forty nine individual company were found in the market of Monirampur upazila among which 8 brands [6 of Zinc sulfate (mono), 1 of Zinc sulfate (hepta) and 1of Chelated zinc] were mostly available, 13 were moderately and 56 were less available. According to Fertilizer (management) Act-2006 of Government of Bangladesh, the product without registration number and MRP on their packet is not allowed to market. However, this study found 10% of Zinc sulfate (hepta) were registration number less brand in the market. In that case, they should not practice such in their business. The brands without any registration number might be adulterated. Remarkable variation was observed among the MRP of the brands of each category. On the other hand, MRP of Chelated zinc was too much higher than Zinc sulfate (mono) and Zinc sulfate (hepta). Lower MRP of same type of product might cause adulteration also. Therefore, chemical analyses for quality of all categories of zinc fertilizer is very much important to see the actual scenario. However, the study suggests that (a) illegal company should be taken under regulation and (b) further study is needed to assess the individual quality status of all the brands of three categories of zinc fertilizer obtained in this study.

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