

Article

Present status of aqua-medicines used in aquaculture at Jessore sadar upazila, Bangladesh

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Received: 07 September 2018/Accepted: 26 September 2018/ Published: 30 September 2018

Abstract: In order to know the present status of aqua-medicines used in aquaculture activities in Jessore district, Bangladesh a rigorous investigation was conducted with fish farmers and representative of pharmaceutical companies from January, 2016 to May 2016. An extensive assortment of aqua-medicines was comprehended throughout pond preparation and water excellence administration by the agrarians. Amongst them Zeo-Fesh, Zeo Prime, Ecolite, Megazeo plus, Geotox, Jv Zeolite, Acmes, Benthos, Pond life, were extensively used in field level. Disinfectants has precise significance; far and wide used by the agrarians and the furthestmost prevalent disinfectants are Pathonil, Timen, Fmsen, Virex, Aquakleen etc., the reimbursements of disinfectants are to inhibit dissimilar categories of bacterial, fungal and viral diseases resembling gill rot, tail rot, dropsy etc. to uphold sanitized circumstance in pond apparatus and floorings and in some circumstances use to treat disease. Numerous aqua-medicines were established in the aqua-medicines retailers that were informed to be used as noxious gas reducer. The obtainable deadly gas reducer were gastrap, gas stop, gasonex plus, ammonil besides that, remunerations of using venomous gas reducer are to eliminate the lethal gas like NH₃, H₂S, CO₂ etc. since the bottommost of pond to diminish concentration of ammonia. For upgrading of dissolve oxygen level, Oxyflow, Oxy-max, Bio Care, Bio-Ox, Oxy-Gold, Oxy-A, Oxy-life were extensively used in the study area. A number of aqua medicines were found in the aqua-medicine enterprise used as growth promoter in addition to upsurge yield performance like, Megavit Aqua, Aqua Boots, Aquamin, Acimix etc. were extensively used in study area. Countless pharmaceutical companies have been chronicled to marketplace these aquaculture healthcare products. Furthestmost of the products have been promoted from diverse republics like USA, Thailand, Malaysia, Belgium, and China and values were inconstant, but appeared to be reasonable to agrarians. The contemporaneous investigation pointed out numerous restraints concomitant with the use of such aqua-medicines, comprising nonexistence of methodological acquaintance of agrarians about use of aqua-medicines.

Keywords: aqua-medicines; aquaculture; Jashore sadar upazila

1. Introduction

Aquaculture is one of the furthestmost significant segments which performance a noteworthy character in the economy of Bangladesh in term of foodstuff, nourishment, revenue, and occupation and overseas exchange wages. In Bangladesh aquaculture is promptly dispersal in contemporary years, nonetheless cannot accomplish the aim production for numerous obliging features (Hossain *et al.*, 2014). Fish disease is one of the furthestmost frightening aspects (Subasinghe *et al.*, 2000). Aqua medications are definitely indispensable constituents to magnificently accomplish the aquaculture, which have been formulas for epochs (Hossain *et al.*, 2014). Practice

of medications for the administration of aquaculture is extensively acknowledged. Efficacious aquaculture is nowadays contingent on the chemicals (Faruk *et al.*, 2008) which have been used in innumerable approaches for epochs (Subasinghe *et al.*, 1996). Aquaculture medicines are noteworthy constituents in well-being administration of aquatic creatures, pond manufacture, soil and water management, develop aquatic output, feed preparation, manipulation of reproduction, growth upgrade and dispensation and value addition of the ultimate product (GESAMP, 1997; Subasinghe *et al.*, 1996). A diversity of further medications is likewise used in aquaculture for health administration of fish distant from antibiotics. There are more than a few aqua medications used in aquaculture for healthiness management. These incorporated sodium chloride, formalin, malachite green, methylene blue, potassium permanganate, sumithion, cypermethrin, glutaraldehyde and tryfluralin. (Phillips, 2000; Hasan and Ahmed, 2001; Brown and Brooks, 2002; DoF, 2002; Sharmin *et al.*, 2016; Hossain *et al.*, 2016; Monir *et al.*, 2015; Faruk *et al.*, 2005; Chowdhury *et al.*, 2015; Shabuj *et al.*, 2016; Yeasmin *et al.*, 2016; Rahman *et al.*, 2017 and Neowajh *et al.*, 2017). Additional widespread old-fashioned aqua-medicines encompassed Megazeo plus, oxy-aqua, paeicox, Lisovit, Timcel, Raj-Fume, Oxytetracin, Eon fish vita, Bio-ox, Oralyte, Zeo-fish, Zeo-prime, Ecolite, etc. Tesmin, Emsen, Polgard, Virex, EDTA, Gypsum, Lime, Alum were used for the perseverance of pond soil, toxic gas remover and water superiority management. Oxyflow, Oxymax, Bio Care, Bio-Ox, Oxy-A, Oxy-Life are widely used to increase dissolve Oxygen Level. Aqua-C, Aqua Boost, Cevit-Aqua, Rena C, Vitax-C, are used to growth supporter. These are far and wide used to counterbalance acidity, upsurge total alkalinity, escalation hardness in the soil and water of grow out pond, condense turbidity in ponds, chalets divalent and trivalent metal cautions etc. Bangladeshi aquaculture is escalating swiftly besides inclinations of expending supplementary aqua-medicines in aqua-health management. Nethermost of the agrarians do not recognize the applicable dosage in addition procedures of application. It has been comprehended that agrarians were expending these aqua-medicines deprived of knowing their effectiveness. This is attributable to nonexistence of information concerning the contemporary eminence and penalties of aqua-medicines consuming in aqua-health management. Aquaculture practices are growing progressively in Bangladesh. Consequently, tendency of usage of aqua-medicines is correspondingly snowballing. Particular mutual compounds consist of sodium chloride, formalin, potassium permanganate, potash, copper compounds, malachite green, methylene blue etc. (Li *et al.*, 1996). Dealing by sodium chloride is a longstanding treatment for diseases of fish. It is customarily used for parasitic and fungal disease of fish. Formalin and malachite green are extensively used for peripheral parasitic disease and EUS of fishes. Potassium permanganate (KMnO₄) is used for treatment of ponds water. It is virtuous for protozoan infiltrations on skin, gills and fins (Floyd, 1993). Frequently used elements in Bangladeshi aquaculture are lime, rotenone, innumerable formulas of inorganic and organic fertilizers, salt, dipterex, antimicrobials, potassium permanganate, copper sulphate, formalin, sumithion, melathion etc. Allowing for the overhead realities, the contemporaneous investigation was accompanied to categorize the varieties of aqua-medicines used in aqua-health administration and to distinguish persistence of using, applicable dosages and technique of application of aqua-medicine in fish culture at Jessore sadar upazila, Jessore, Bangladesh.

2. Materials and Methods

2.1. Study area and periods

The study was carried out at Jessore sadar upazila (Chanchra union), Jessore, Bangladesh, coordinates 23°08'31.6"N 89°11'45.3"E from January, 2016 to May, 2016 to know the various types of aqua drugs and comical used for fish culture.

2.2. Target group

Data was collected from different target groups such as commercial fish farmers, small scale fish farmers and chemical sellers.

2.3. Methodology

Data were gathered through questionnaire interview. The surveys was self-possessed of in cooperation barred and exposed arrangement of inquiry. A set of initial questionnaire was organized in which the foremost matter of questionnaire were the label of chemicals, active ingredients persistence of use, techniques of application and doses extent, cradle, possessions on environment, effect on healthiness and production output. For the interview, modest random sampling technique was tracked.

2.4. Data collection

2.4.1. Primary data collection

Primary data were collected from different target groups to have an overall scenario of the aqua-medicines used in aquaculture activities in this area through questionnaire interview, PRA and FGD. Structured questionnaire was designed for 40 Fish farmers and 20 drug sellers.

2.4.2. Secondary data collection

Secondary data was collection from different fishers related arranged from, endemic non-government organization, government agency such as; DoF, BFRI, DFO, UFO, Journals, Books etc.

2.5. Data analysis

The data were analyzed using tabular and descriptive statistical techniques using MS Excel 2010 as well as the summary tables were prepared in accordance to the objective of the study.

3. Results

3.1. Available zeolite in market

The mixture of SiO_2 , Al_2O_3 , Fe_2O_3 , CaO etc. which form a minute pore and sponge like structure are called zeolite. Different types of toxic gases like NH_3 , H_2S and harmful pathogen become trapped in the pore of such compounds. A vast number of commercial zeolites are available in the market among them Zeo-Fresh, Zeo Prime, Ecolite, Megazeo plus, Geotox, JV Zeolite, Acmes, Benthod, Pond life were widely used in field level (Table 1).

Table 1. Available zeolites in the study area along with dosage and price.

Sl. No	Medicine name	Company name	Active Ingredient	Dosage	Price (Tk.)
1.	Zeo Fresh	Square	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O , LOi,	24 Kg/acre	45/Kg
2.	Zeolite Gold	Fish tech	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O ,	400-500 g/dec	55/Kg
3.	Aqualite	Century	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O , K_2O , TiO_2	20-25 Kg/acre	50/Kg
4.	Pond Lite	ACI	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O	20-30Kg/acre	60/Kg
5.	Ecolite	Eon	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O , K_2O , Mn, P	7 Kg/33 dec	55/Kg
6.	Zeo prime	Sk+F	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O , TiO_2 , K_2O	6-8 Kg/33dm	70/Kg
7.	Geotox	Novartis	SiO_2 Al_2O_3 , Fe_2O_3 CaO MgO, Na_2O	20-25Kg/100dm	55/Kg
8.	Mega Plus	Zeo ACI	SiO_2 Al_2O_3 , Fe_2O_3 CaO , MgO Na_2O , MgO, Na_2O , K_2O , Mn	25Kg/100dm	55/Kg
9.	JV Zeolite	Eon	SiO_2 Al_2O_3 , Fe_2O_3 CaO , MgO Na_2O	6-7/Kg/33 dec	350/10 Kg
10.	Benthod	ACI	Organic manure, vitamin, Minaral	100-150- g/dec	750/20Kg
11.	Geotox	Navarties	SiO_2 Al_2O_3 , Fe_2O_3 CaO , MgO Na_2O	20-25 Kg/dec	55/Kg
12.	ACME's	ACME	SiO_2 Al_2O_3 , Fe_2O_3	10-15Kg/acre	375/10Kg
13.	Pond Life	Renata Ltd.	Probiotics	200g/Bigha	2100/Kg

3.2. Available disinfectants in market

The most popular disinfectants are Timsen, Pathonil, Emsen, Virex, Aquakleen in the study area (Table 2). The benefits of use of disinfectants in the ponds are to prevent different types of bacterial, fungal and viral diseases like gill rot, tail rot, dropsy etc. to maintain hygienic condition in pond equipment and floors and in some cases use to treat disease.

Table 2. List of available disinfectant in study area.

Sl. No	Medicine name	Company name	Active ingredient	Dosage	Price (Tk.)
1.	Polgard	Fish Tech BD	3Methyl, 4 Alkyl two chain Brominates compounds	500ml/acre	460/200ml
2`	Pathonil	ACI Animal Health	Alkyl dimethylbenzyl Ammonium Chloride 80 % or (BKC) 80 %	6ml/dec	265/100 ml
2.	Virex	ACI Animal Health	Potassium Peroximono sulphate 50%	100-150g/ 33dec	100/100g
3.	Virofore	Square	Iodine 2.8%	100ml/33dec	100/100ml
4.	Aquak leen	Square	Tetrad sail Tri-methy Amonium Bromide,BKC	0.5-1 1/arc	300/1
5.	Timsen	Eon	n-alkyl dimethyl benzyl ammonium	20 g/33dec	260/50g
6.	Emsen	Ethical	n-alkyl dimethyl benzyl ammonium chloride+stabilized urea	80 g/33dec	255/50g
7.	Ossi C	Fish Tech	Oxilinicacid, Betaglucan, Vitamin-C	4-5 g/Kg feed	380/100g

3.3. Available nontoxic gas reducer in market

Usually toxic gas reducer are used to remove the toxic gas like NH₃, H₂S, CO₂, etc. from the bottom of pond, to reduce concentration of ammonia and to remove off odor of water and create hygienic condition in pond. The available toxic gas reducer were gastrap, gas stop, gasonex plus, ammonil. The active ingredients of such medicines were mainly sodium lorile ether sulphate, aluminum hydroxide, silicon di oxide, bacillus subtilis, lactic acid etc. (Table 3).

Table 3. List of available toxic gas reducer in market and field level.

Sl. No	Medicine Name	Company Name	Active Ingredient	Dosage	Price (Tk.)
1.	Gastrap	Square Pharmaceuticals	Lactic acid Bacillus sp Bacillus Subtillis	200 mg/acre	3000/Kg
2.	Gas stop	Organic Pharmaceuticals	Bacillus subtillis A12 SiO2	500 mg/acre, 3 Weeks	2500/Kg
3.	Gasonex Plus	Fish tech.	Na- lorile ether sulphate	200-400 mg/Kg	2950/Kg
4.	Pond Dtox	Fish tech.	Pracoccus pantotrophus	4ppm	2800/Kg
5.	Aqua Magic	Fish tech	Azolabactor chorococum Bacillus subtilis, Candida utilis	5 Kg+100 g Sugar+250g rice bran mixed with 10 liter water	2700/Kg
6.	Ammo nil	Noverties	Yucca plant extract, Bacillus subtillis, Candida utilis	100-200 g/acre	2900/Kg
7.	Bio-Aqua-50	Eon animal health Co. Ltd	Yucca plant extract Saponin	60-70ml/33 dm	2900/Kg
8.	Yucca				

3.4. Aqua-medicine for improvement of dissolve oxygen level

For improvement of dissolve oxygen level, Oxyflow, Oxyamax, Bio Care, Bio-Ox, Oxy-Gold, Oxy-A, Oxylife were used (Table 4).

Table 4. Aqua –medicine used to improve dissolve oxygen level.

Sl. No	Medicine Name	Company Name	Active Ingredient	Dosage	Price (Tk.)
1.	Oxyflow	Novartis	H ₂ O ₂ 10%	General dose 250- 350g/acre	800/Kg
2.	Oxyamax	Eon	Calcium per oxide	250-300 g/acre	360/500g
3.	Bio Care	ACI	Sodium Lorile Ether Sulphate	80-120 MI/100 dec.	300/L
4.	Bio-Ox	ACI	Sodium per carbonat	10g/ dec	475/Kg
5.	Oxy-A	Acme	Sodium per carbonat	300/400 g/acre	480/Kg
6.	Oxylife	Square	O ₂ Precursors,Prebio- Tics, Detoxificant	400 g/acre	610/Kg

3.5. Growth promoter available in market

Several aqua medicines were found in the aqua-medicine company used as growth promoter as well as to increase production. Medicine like Megavit Aqua, Aqua Boots, Aquamin, Acimix, Super-fish, Aqua-C, Cevit-Aqua, Square Aquamix, Panvit-Aqua, Cp-Vet WSP, E-Vet plus, Vitamix F-Aqua, Rena-WS, RenaC, Rena Fish, Vitax-C, Vitax-ES, Charger Gel and Bio-Permixon (Gold) were used (Table 5).

Table 5. Aqua-medicine used as growth promoter.

Sl. No	Medicine Name	Company Name	Active Ingredient	Dosage	Price (Tk.)
1.	Aqua-C	ACI	Vitamin C Bp 50g	2-4 g/Kg feed	100/100g
2.	Aqua Bosst	Novartis	Organic acid, Beta, Glucan, Manna, Oligosaccharide	500 g/ ton feed	580/Kg
3.	Cevit-Aqua	Square	L-Ascorbic acid 990 mg	2-3 g/Kg feed	210/100g
4.	E-Vet plus	ACME	VitE100mg, Selenium.5mg	5ml/Kg feed	385/500ml
5.	Vitamix F- Aqua	ACME	Vit A,D,E,B Folic acid Ca,Mg,P,Fe,Cu etc	1 g/Kg feed	280/Kg
6.	Rena C	Reneta	Ascorbic acid 99g	1-2g/Kg feed	1725/Kg
7.	Vitax-C	Eon	VitC Bp 100mg/g powder	1-2 g/2-3Kg feed	200/100g
8.	Bio- Premix(gold)	Fish Tech	Vit A,B,D,E,C,K	100-150 g/100 Kg feed	360/Kg

3.6. Antibiotics used for fish disease treatment

Most farmers used Oxy-sentin 20% Captor, Acimox (vet) power, Aquamycine, Oxy-Dox-F 100, Oxy-D Vet, Renamycin Soluble Powder, Moxilin Vet WSP, Tetravet WSP, Doxy-A Vet WSP for disease treatment (Table 6).

Table 6. Available antibiotics for disease treatment.

Sl. No	Medicine name	Company name	Active ingredient	Dosage	Price (Tk.)
1.	Aquamycine	ACI	Oxytetracyclin HCL25%	1-2 g/Kg feed	70/100g
2.	Oxy-Dox-F100	ACI	Oxytetracyclin HCL 20%+Doxycycling	1-2 g/Kg feed	150/100g
3.	Oxy-sentin 20%	Novartis	Oxytetracyclin HCL 200mg	100-200 g/100Kg	840/1 Kg
4.	Renamycin Soluble powder	Reneta Ltd.	Oxytetracyclin 200 mg	50 mg/Kg body wt.	72/100g
5.	Oxy-d-D Vet	Eon	Oxytetracyclin 20% Doxycyclin 10%	5-10 g/Kg body wt.	172/100g

3.7. Available aqua-medicines and market share of companies in the study area

Several medicines are available and their mode of use is also different which varies from company to company. Use of drugs and popularization assessment and percentages stated Table 7 and Table 8.

Table 7. Popular aqua-medicines in field level in use.

Sl. No	Medicine Name	Company Name	Number of fish farmers Questioned	Number of Responded	Percent responded
1.	Zeolite				
	Zeo-fresh	Square	40	6	15
	Zeo-prime	SK+F	40	10	25
	Mega-zeo plus	ACI	40	20	50
	Zeo-lite gold	Fish tech	40	4	10
2.	Disinfectants				
	Timsen	Eon	40	20	50
	Emsen	Ethical	40	4	10
	Virex	ACI	40	10	25
	Aquakleen	Square	40	6	15
3.	Toxic gas reducer				
	Gas trap	Square	40	8	20
	Bio-aqua	Eon	40	6	15
	Ammonil	Noverties	40	20	50
	Pond Dtox	Fish tech	40	6	15

Sl. No	Medicine Name	Company Name	Number of fish farmers Questioned	Number of Responded	Percent responded
4.	Improve dissolve oxygen				
	Oxyflow	Novartis	40	12	30
	Bio Care	ACI	40	4	10
	Bio-Ox	ACI	40	20	50
	Oxy-life	Square	40	4	10
5.	Growth promote				
	Cevit-Aqua	Square	40	12	30
	Rena C	Reneta	40	12	30
	Vitax-C	Eon	40	10	25
	Bio-premix	Fish tech	40	6	15

Table 8. Number of products of different pharmaceutical companies.

Sl No.	Company Name	Number of products	Products (%)
1	ACI	18	12.00
2	Rals Agro	12	8.00
3	Novartis	7	4.66
4	Eon	9	6.00
5	Fish Tech	17	11.33
6	Square	9	6.00
7	Advanced animal health	8	5.33
8	The ACME	12	8.00
9	Organic	13	8.60
10	Other 10 companies	46	30.08

3.8. Problems associated with the use of aqua-medicines

During the present study some problems were identified like, aqua-medicines may persists and retaining their biocidal properties in aquatic system for longer period; it may create problem for non-target species; over doses may create toxicity problem of water; major concern the use of antibiotics in aquaculture involve the development and transfer of drug resistance to pathogenic bacteria from farm animal to human; lack of technical knowledge of fish farmers about the use of aqua-medicines; and lack of knowledge of fish farmers about residual effect and withdrawal period of aqua-medicines.

4. Discussions

For water quality improvement a number of traditional as well as aqua drugs were recorded in the market such as Geotox, JV Zeolite, Mega Zeo, Bio Aqua-50, Acme's Zeolite, Benthod, Ammonil, Aquakleen, Gastrap, Biomin Pond Life, Biomin Aquaboost, Zeolite Gold, Polgard+ and PondDtox were used. Faruk *et al.* (2008) also found drugs like Geotox, JV Zeolite, Mega Zeo, Lime, Bio Aqua and Acme's Zeolite used for improving water quality. Ali (2008); Mishra *et al.* (2017a); Ahmed *et al.* (2015); Chowdhury *et al.* (2015); Hasan *et al.* (2015); and Rahman (2011) observed slightly different types of chemicals used for improving water quality of fish ponds like Geotox, Green Zeolite, Lime, Pontox Plus, Mega Zeo, Benzo, Zeocare, Bio aqua, Bis Zeolite, Super-Zeolite, Bio-Tuff, Acme's Zeolite, Aquazet, Fish Grow and biolite Plus. Moreover, chemicals like Urea, TSP, cow-dung and MP used mainly for increasing primary productivity in the fish ponds. Disinfectants are widely used in many sphere of aquaculture. They are mainly used to disinfect Pond and other equipment. It also used as disease treatment in some case. The chemicals widely used as disinfectants in aquaculture in Jessore district include Formalin, lime, Bleaching powder, Ossi C, timsen, Virex, Polgard Plus, Eraprim vet and GPC-8. Rahman (2011); Chowdhury *et al.* (2015); Miah *et al.* (2016); Rahman *et al.* (2017); Hossain *et al.* (2018) and Rahman *et al.* (2015); observed that disinfectants were Polgard Plus, Bactisal, Virex, Biogaurd, Lenocide, timsen, Emsen, Aqua Cleaner Plus, formalin and bleaching Powder. Toxic gas reducer is widely used in many sphere of aquaculture. They are mainly used to toxic gas reducer Pond and other equipment. It also used as disease treatment in some case. The chemicals widely used as toxic gas reducer in aquaculture in Jessore district. Included gas trap, gas stop, pond D tox, Aqua magic, Ammolin Nil. Rahman (2011); Chowdhury *et al.* (2015); Dipu *et al.* (2014); Chowdhury *et al.* (2012); Rasul *et al.* (2017) and Islam *et al.* (2017b) observed that disinfectants were gas trap, gas stop, pond D tox, Aqua magic. To increase dissolve oxygen in fish ponds farmers of the investigated areas used several chemicals like Oxyflow, Oxy-max, Bio Care, Bio- Ox, Oxy-Gold, Oxy-A and Oxy-life. Rahman (2011); Mishra *et al.* (2017b); Pathak *et al.* (2000); Chowdhury *et al.* (2015);

Rahman (2011) and Rahman (2013); observed that aqua drugs like Oxy-Gold, Oxylife, Bio Care, Oxy Plus, Pure Oxy, Oxymax and Oxy flow were used to increase dissolve oxygen. According to local agents of Novartis Pharmaceuticals Ltd., Eon Animal health Products Ltd., ACI Animal Health and Square Ltd., Oxyflow, Oxymax, Bio- Ox and Oxylife are used to remove hardness and poisonous gases from pond. To increase the growth of pond fish's farmers of the study areas used several growth promoter such as Aquamin, Acimix Superfish, Aqua-C, Megavit-Aqua, Aqua Boost, Cevit-Aqua, Square Aquamix, Panvit-Aqua, Cp-Vet WSP, E-Vet Plus, Vitamix FAqua, Rena-WS, Rena C, Rena Fish, Timsen, Vitax-C, Vitax-ES, Charger Gel and Bio-Permix(gold). The active ingredients of the mentioned products are Vitamin, Mineral, Amino Acid, Organic acid, β -Glucan, Binder, Aloe Vera and Multivitamin. Ali (2008); Chowdhury *et al.* (2015); Hossain *et al.* (2014); Sharker *et al.* (2014) and Islam *et al.* (2014) observed Aqua drugs like Megavit Aqua, Aqua Boost, Orgavit Aqua, Vitamin Premix, Aqua Savor, Grow Fast, Diginex, Aqua, Fibosol, Aqua Grow-P, Vitamix F Aqua, Cevit Vet, diamond Fish, AQ Grow-G, Nature Aqua GP, ACmix Super-Fish and Aquamin Powder with the active ingredients include Vitamin, Mineral, Amino Acid, Organic acid, β -Glucan, Binder, Aloe Vera and Multivitamin were used as growth promoter. Rahman (2011); Anwar (2014) beside Alam and Rashid (2014) was observed that aqua drugs used as growth promoter were charger Gel, Aqua Boost, Bio-Grow and Grow Fast. The entire growth promoter played a vital role for rapid growth of fishes. According to chemical sellers of study area aqua Boost and AC Mix Super-Fish also used to prevent diseases in fish. Faruk *et al.* (2008) observed that Aqua Boost and AC Mix Super-Fish also had disease preventing ability in fishes. About Five antibiotics with different trade names were used by the farmers in the study areas such as Aquamycine, Oxy-Dox-F 100, Captor, Oxysentin 20%, Doxy-A Vet WSP, Tetravet WSP, Moxilin Vet WSP, Renamycin Soluble Powder and Oxy-D Vet. A number of authors also reported similar conditions about the use of antibiotics in aquaculture of Bangladesh. (Phillips, 1996; Brown and Brooks, 2002; Faruk *et al.*, 2005 Chowdhury *et al.*, 2015; Rodgers and Furones, 2009; FAO/OIE/WHO 2006; Sekkin and Kum, 2011; Amit *et al.*, 2017; ICAR 2016). According to the evidence of brochure delivered by animal health products above antibiotics were effective against bacterial diseases. Monsur (2012) observed that farmers used various aqua drugs and chemicals such as Geotox, Mega Zeo, Lime, Bio Aqua, Timsen, Efinol, Polagard Plus, Oxyflow, Oxy-A, Potash, salt, Chapter, Megavit Aqua, Aqua Boost and ACmix Super-Fish against fish diseases and health problems of their cultured fishes. MacMillan (2001) mentioned that antibiotics should be used only for the treatment of bacterial diseases. In a questionnaire interview, local agent of Novartis Animal Health mentioned that some of above antibiotics like Oxysentin 20%, Captor were also effective against EUS. Ali (2008) and Rahman (2011) also that antibiotic like Oxysentin 20%, orgacycline 15% were effective against EUS. Antibiotics were most effective when administrated at the early stage of disease. Aoki *et al.*, (1990) also found that antibiotics were most likely to be effective when administrated at the early stage of a disease. Uses of antibiotics are responsible for environmental pollution and affected human health due to drug residues. Burrige *et al.* (2008) observed that use of antibiotics for aquatic animals might not only initiate environmental pollution problem but also affected human health due to drug residues. Disease is a foremost common incident in aquaculture, whereas Adhikary *et al.* (2018); Islam *et al.* (2017a); Asif and Habib (2017) remarks disease is the main problem of their respective research area. The constrains found in this investigation were biocidal properties in aquatic system; cause irritation for non-target species; excess doses; development and transmission of drug confrontation; nonexistence of methodological awareness about the usage of aqua-medicines; and lack of about residual effect and withdrawal period which is similar with the Vaumik *et al.* (2017); Zaman *et al.* (2017); Faruk *et al.* (2018) study.

5. Conclusion

The current study on aqua-medicine pointed out several hitches of using aqua-medicines. Unfortunately little attention has been paid on the documentation of aqua-medicines. As a result, there is a lack of information regarding the impact of those aqua-medicines. However, respective authority, policy maker, scientist and researcher should work together to reduce the negative impact of aqua-medicines.

Conflict of interest

None to declare.

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