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A Microbial study of water at Harda (M.P.) special reference to enteropathogen

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Abstract
Water sources are most important for us because they yield the potable water, using of variety of purpose like irrigation, manufacturing, and domestic. But recent decades they are going too polluted by the bacteria. Present study collects the sample of different sources of water and analysed in the Microbiological laboratory with apply the stranded plate count method and compare the result with WHO standard. Water quality evaluates the awareness of people for maintaining cleanness and hygiene conditions for storage of drinking water. *Salmonella*, *Shigella*, *Vibrio cholera* and *E. coli* was seen in abundances these bacterial species responsible for intestinal disease.

Keywords: water, polluted, bacterial, intestinal

Introduction
Water is essential to life but many people do not have access to clean and safe drinking water. All living things need water for them survival. Although water cover than 70% of earth surface less than 1% of that resources is available as fresh water and this is not evenly distributed throughout the world [1, 2]. Water is used for a variety of purpose including drinking, irrigation, manufacturing and domestic. Industrial and domestic using of water will develop the pathogen and contaminants in water resources because its drainage joins direct or indirect to water sources. Major disease causing enteropathogens are *Salmonella*, *Shigella* and *Vibrio* these are found in water bodies which are responsible for severe disease in gastrointestinal tract [3, 4, 5]. *E. coli* is a gram negative colon symbiotic bacterium which is found in all endotherms. Rest of E. coli all three bacteria are most pathogenic and gram negative strains [6, 7].
Harda town is a district of Madhya Pradesh which situated in the central of India, many water resources available for drinking purpose in this town. The people use the water for drinking purpose are majorly two sources first are tube well water and second municipal supply water. Recent decades observe disease affect in citizens like typhoid, dysentery, cholera and other intestinal diseases. Most bacterial pathogen potentially transmitted by the water inters the gastrointestinal tract and are excreted in the faeces of infected human.

Material and Method
The present study designed to analyse the microbiological quality of drinking water from various sources like tube well water and municipal supply water in town Harda [8]. Water sample were collect from January 2018 to April 2018 with sterile plastic bottle and analyzed in the microbiology lab by APHA (1992) standard methods [9, 10, 11].
All samples were immediately transported to the laboratory and processed within one hour. For bacteriological analysis used the Standard Plate Count (SPC) was done by Pure Plate Technique, in this method sample was poured in empty sterile petridishes about 15- 20 ml of culture media like MacConkey agar media and Eosine methylene blue agar media (EMB) was added to each plates and incubated at 37 ºC for 24- 48 hour. Plates are showing the colonies of faecal Coliforms. Isolated colonies of coliforms were confirmed by using biochemical tests. Xylose- lysine Dextrose agar (XLD) for detection of suspected pathogens l *Salmonella spp.* and *Shigella spp.* Thiosulphate citrate Bile salt sucrose agar (TCBS) for the detection of *Vibrio spp* [12].

Result and Discussion
Table 1 showing different bacterial colony on the incubated petriplate result showing water quality difference between various sites. Municipal supply water is poor quality due to pathogenic bacterial contamination in this water has *Salmonella*, *Shigella* and *Vibrio* bacterial growth, 1-10 approx colonies reported of enteropathogen bacteria and 20-30 colonies reported of *E. coli* during work. The water quality of tube well quality also poor but better than municipal supply water because there was no *Shigella* colony seen during research.

Table 1: Showing bacterial colony on petriplate

S. No	Sample	*E. coli*	*Salmonella*	*Shigella*	*Vibrio*
1.	Municipal supply	++	+	+	+
2.	Tube well	++	+	-	+
3.	Tap water	+++	+	++	+
4.	Treated water	+	-	-	-
5.	Drainage water	+++	++	+++	+++
6.	WHO limit (for drinking)	+	-	-	-

(+)= Under ten colony, (++) = under thirty colony, (+++) = More than thirty colony, (-) = zero colony.

Tap water quality is absolutely poor because all type of

bacterial colonies seen in this water. WHO is not permits to use this water as drinking purpose. The bacteriological analysis of water determines the portability of water. Bacteriological analysis showed the four microbes in water sample of Harda town (M. P). All samples had *E.coli* as indicator of faecal pollution (Table-1) *Salmonella spp*. was found in Tap water and waste water sample. *Shigella spp*. was present in tap water and drainage water sample. *Vibrio spp*. found in tube well water, tap water and drainage water sample. The entire water sample in different sources contaminated with high amount of bacterial population. The reason for high numbers of bacterial colonies might be due to inadequate maintenance of water resources. *E. coli* are the most widely adopted indicator of faecal pollution and they can also be isolated and identified simply with their numbers usually being given in the form of faecal coliform (FC)/100ml of waste water (De Boer 2000) Outbreaks of these disease can occurs as a result of drinking water from different sources polluted by a combination of different waterborne microorganism spp. eating contaminated fish or indulging in recreational activities in polluted water bodies containing water borne pathogens. *E. coli* can cause serious disease, such as Urinary tract infection, Bacteraemia and Meningitis. *Salmonella spp*. are causes the four type of typical clinical manifestation like Gastroenteritis, Bacteraemia or Septicaemia, Typhoid fever/Enteric fever. *Shigella spp*. can cause serious intestinal disease, including bacillary dysentery. *Vibrio cholerae* cause Cholera disease which is infection of small intestine.

Conclusion

WHO reports suggests that 80% of all human illnesses in the developing world are caused by biological contamination. The present investigation includes that the quality of water samples subjected to study was mainly analysed for the bacteriological contamination while *E-coli* an indicator of faecal pollution was found in all samples. The drainage water sample was most polluted water of Harda town. Faecal pollution of drinking water may introduce a verity of intestinal pathogen their presence may cause diseases from mild gastroenteritis to severe and sometimes fatal dysentery, cholera or typhoid In future municipal system will have to aware for water supply.

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