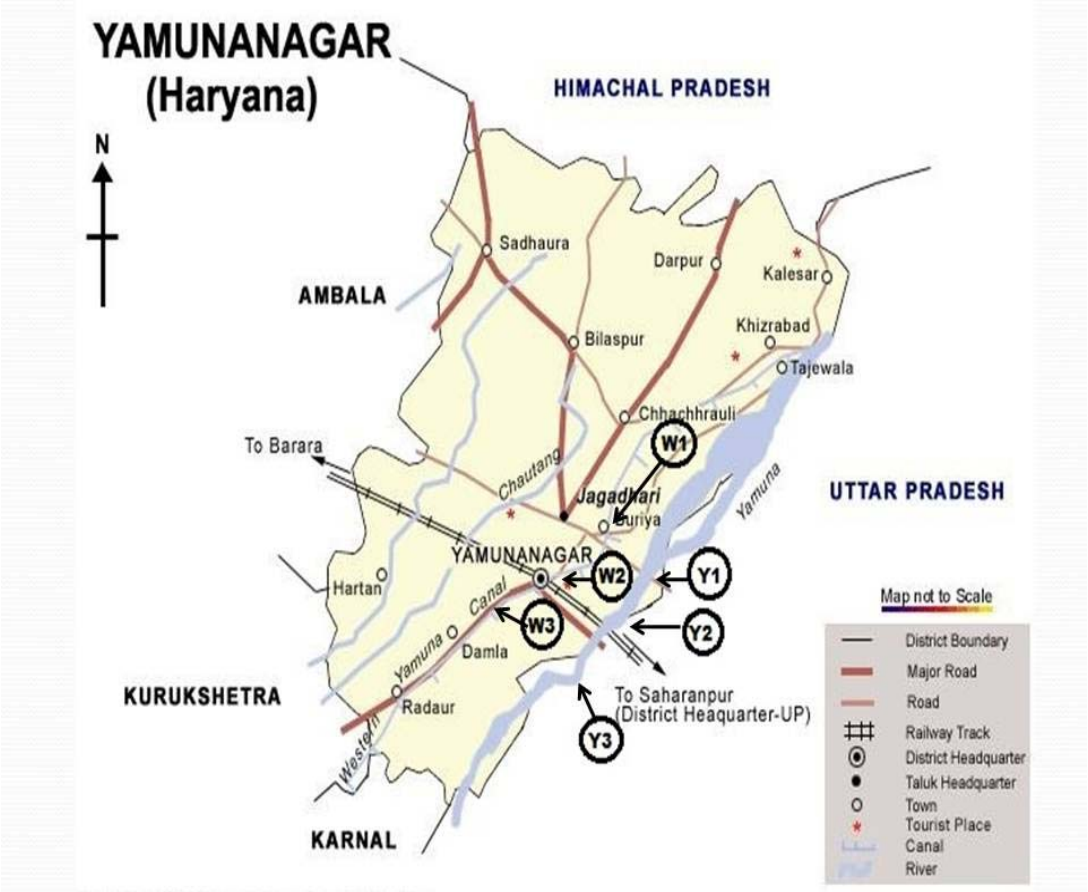

Figure 1: Map of Yamunanagar showing location of selected stations on river Yamuna and Western Yamuna canal.

3. Results and Discussion

River Yamuna shows higher number of taxa as compared to western Yamuna canal. Thirteen number of taxa were recorded from river Yamuna and only four taxa from western Yamuna canal belonging to groups Cladocera, Rotifera, Copepoda, Protozoa, Ostracoda and Trematoda (Fig. 3). Cladocerans were recorded as dominant from both the water bodies. Cladocerans indicate eutropic condition resulting from pollution (Malhotra, 2014; Abrantes *et al.,* 2006). Michael (1985) also designated Cladocerans as bio-indicators.

Total zooplankton's population of river Yamuna varied from 532-95 no L^{-1} and of Western Yamuna canal it was 120-25 no L^{-1}. Total population of zooplankton of river Yamuna show a decline from station Y1 to Y2 and further increase at station Y3 whereas total population showed a decrease from station W1 to W3 in case of western Yamuna canal (Table 1). This may be due to the diversion of the path of flow of western Yamuna canal from station W2 so the station W3 got the effluents in a more concentrated form. A decline in number of planktons with influx of effluents was recorded by many authors (Malhotra *et al.,* 2014; Bhatnagar *et al.*, 2013).

The mean values of species diversity of river Yamuna were found maximum at station Y3 (3.20±0.05) and minimum at station Y2 (3.07±0.08) whereas western Yamuna canal showed maximum values at W1 (1.9±0.1) and minimum at station W2 (1.6±0.0). Low values of species diversity at influx of effluent point were also reported by Trivedi (1981); Bhatnagar and Garg (1998); Malhotra *et al.* (2014) and Malhotra (2014) (Fig. 2).

Sida crystallina and *Daphnia* were the taxa common at both the lotic water bodies indicate them as tolerant taxa (Richard Albert, 2010; Leitao *et al.*, 2013 and Malhotra *et al.*, 2014). Taxa *Polynema* spp., *Cyclops* spp., *Nauplius* spp., *Cypris* spp., *Bosmina* spp., *Moina* spp., *Monostyla* spp., *Keratella* spp., *Branchionus* spp., *Physarum* spp. and *Trinema* spp. were found only at river Yamuna but not at western Yamuna canal showing their insufficiency to tolerate effluents from paper and timber industries. Taxa *Simocephalus* spp. and Miracidium larva were found only at western Yamuna canal but not at river Yamuna showing their intolerance to agricultural runoff.

Table 1: Mean values of total population of zooplankton (Mean±S.E) of river Yamuna and western Yamuna canal at various stations.

	Pre-effluent point	Flux of effluent point	Post effluent point
River Yamuna	300±43.3	193±29.8	248±31.8
Western Yamuna canal	89.3±7.05	50.6±5.09	44±3.43

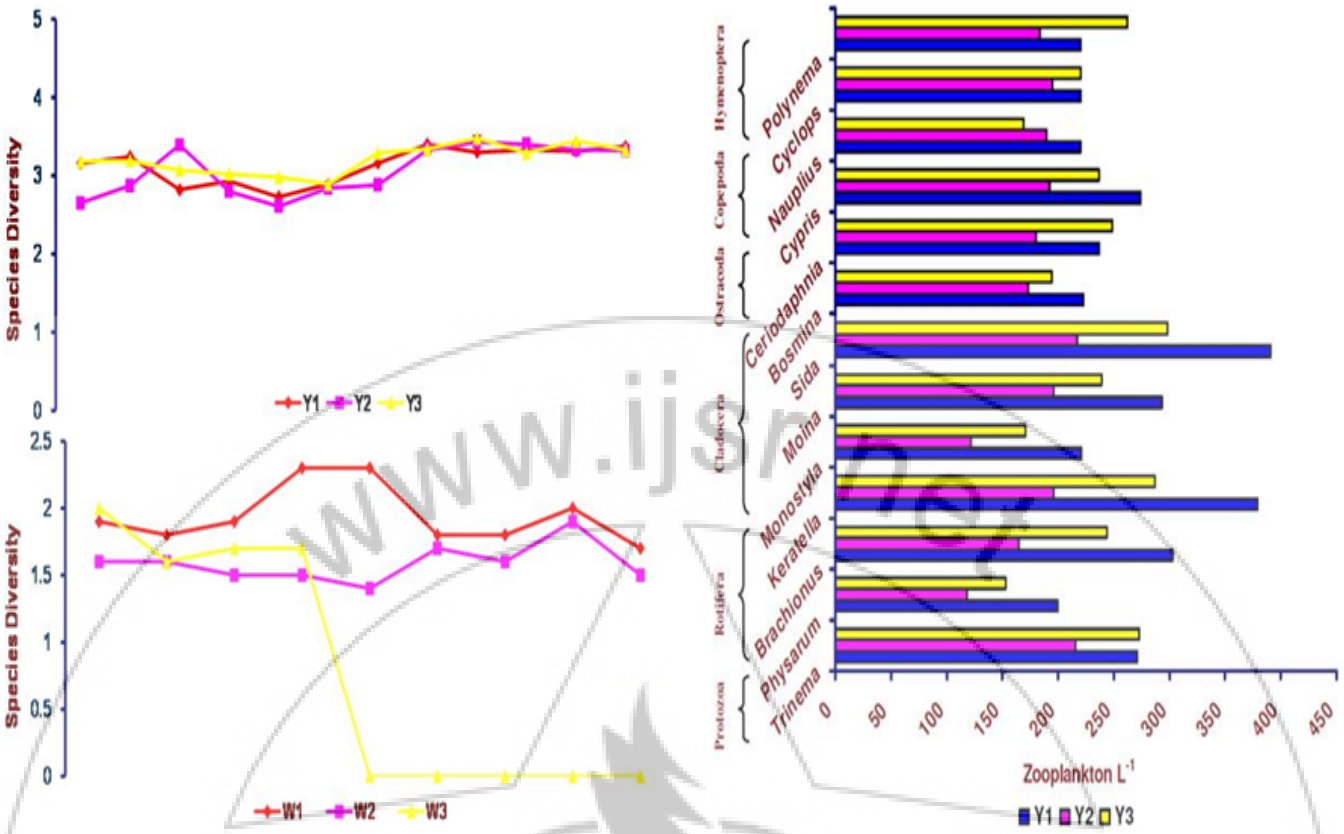

Figure 2: Graphs showing species diversity of zooplankton at various stations on river Yamuna and western Yamuna canal.

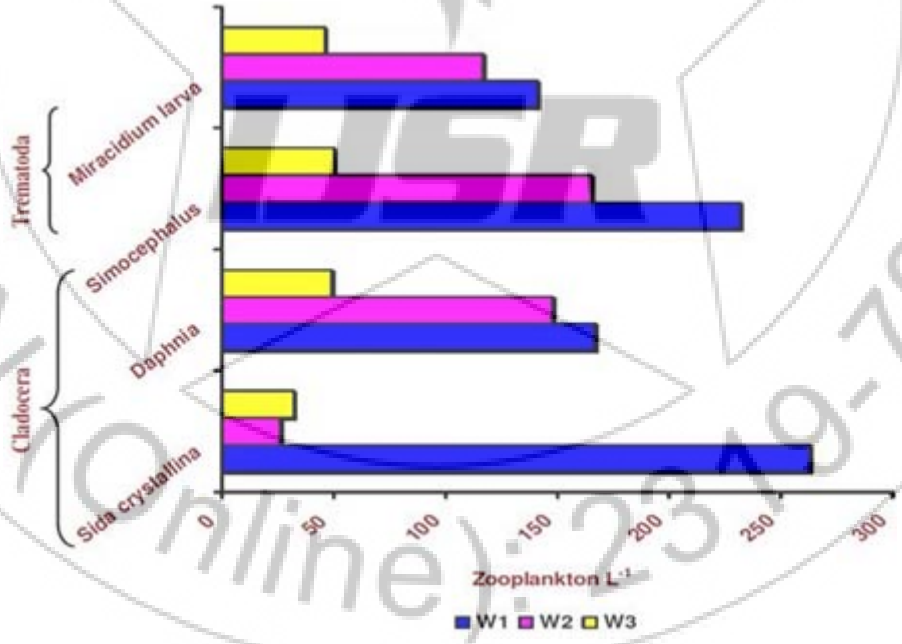

Figure 3: Graphs showing relative abundance of zooplankton on river Yamuna and western Yamuna canal at various stations.

4. Conclusion

Western Yamuna canal has low biodiversity of zooplankton as compared to river Yamuna. Western Yamuna canal is getting effluents from more and diverse number of industries which is adversely affecting its ecosystem. Although river Yamuna has rich biodiversity yet the values are declining at the point of influx of effluents. So, in order to manage the pollution load of river Yamuna and western Yamuna canal it is recommended that various methods of sewage/industrial wastes treatment should be used before the disposal of effluents.

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