











#### 4. Discussion

Microorganisms are attractive sources of biologically active compounds having pharmaceutical and agricultural significance. These actinomycetes are biotechnologically and industrially valuable prokaryotes as they produce a large number of bioactive compounds with pharmaceutical and agricultural importance [32]. In the present study, we have recovered 63 actinomycete isolates from a marine soil sample from Ennore, Muttukadu estuary, Marina Beach, in the coastal region of the Bay of Bengal, India. Out of 63 isolates, MS-60 isolates displayed marked inhibitory activity against MTCC bacterial pathogens in primary screening by cross streak technique. The isolate was characterized as a species of the genus *Streptomyces* on the basis of microscopic and biochemical characteristics. This study evaluated the antibacterial, antioxidant activity and cytotoxicity of the secondary metabolites of *actinomycetes*. The secondary metabolites from the crude extract of Marine *Streptomyces* MS- shows remarkable antibacterial activity against MTCC bacterial pathogens. The antibacterial activity of MS-60 is similar to the results of [33] that gram positive bacteria show good activity than gram negative bacteria. Earlier some marine actinomycetes isolated from Bay of Bengal (Coast of India) were screened for antagonistic and antimicrobial activity against pathogenic bacterial and fungi [34].

Antimicrobial, Antioxidant and Cytotoxic Activity of Marine *Streptomyces* were also studied by Jemimah Naine et al [35]. The concurrent studies of *Streptomyces* sp PM-32 isolated from off-shore sediments collected at the Bay of Bengal coast was reported to have antimicrobial activity against a group of bacterial and fungal pathogens [36]. Zhong [37] et al have recently reported that the EA extract (1 mg/ml) of mycelia of actinomycetes, *Streptomyces* strain Eri12 isolated from rhizosphere of *Rhizoma curcumae Longae* and collected from the Ya'an city of Sichuan province, Southwest of China, showed DPPH• radical scavenging activity (51.87%). Saurav [38] et al studies show that the compound isolated from marine actinomycetes *Streptomyces* sp VITSVK5 has been shown to exhibit 59.32% scavenging activity against DPPH• of free radical at the concentration of 10 µg/ml. The *in vitro* cytotoxicity of secondary metabolites showed a significant antiproliferative activity on HT-29 (Human colon cancer cell line and a dose dependent effect was observed (IC<sub>50</sub> – 26.5µg/ml). Some bioactive compounds were isolated and found selectively cytotoxic against lung and colon cancer cell lines as well as melanoma. Interestingly, the compound exerts preferential antiproliferative effects in colon cancer cell lines with defective p53 systems [39]. Matz et al [40] studies of the biological activity compounds revealed that a few strains had anticancer activity: *Eb6*, with an IC<sub>50</sub> value of 2.8 µg/ml; *Cc1 4*, with an IC<sub>50</sub> value of 6.4 µg/ml. Hellio et al [41] anticancer studies showed the compound of *Sm6*, have an IC<sub>50</sub> value of 5.5 µg/ml against colon cancer cells (HCT-116).

#### 5. Conclusion

Marine organisms produce several active chemicals such as antioxidant and antimicrobial compounds. The present study

also indicated that among the marine actinomycete isolates, *Streptomyces* is the dominant genera and revealed that the diversity of marine actinomycetes from Bay of Bengal and their potential as a source of novel bioactive compounds. It remains important to discover new leader compounds from *Streptomyces* for drug development. In this context, the present study highlighted the antimicrobial, antioxidant and cytotoxic potential of crude extract of a Marine *Streptomyces* species MS-60 isolated from the Bay of Bengal, Tamilnadu, India. The Marine *Streptomyces* species shows remarkable activity for both gram positive and gram negative organisms and its antioxidant activity IC<sub>50</sub> 12 µg/ml.

The crude metabolite from *Streptomyces* spp. had inhibitory action against the growth of Human colon cancer cell line [HT-29]. The *in vitro* cytotoxicity assay on revealed that the secondary metabolite had the strongest cytotoxicity with IC<sub>50</sub> 26.50µg/ml. The bioactive compounds from Marine *streptomyces*. is less toxic to cells. It could be considered as a potential source for anti-cancer drug development. This study suggests that marine-derived actinomycetes are worthy of further exploration as novel drug candidates.

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