CHAPTER 5 CONCLUSION AND SUGGESTION

5.1 Conclusion

5.1.1 The twelve (12) samples were selected from the palm oil plantation and palm oil mill areas such as soil, a rod palm tree, immature bunch, seed of the oil palm empty fruit bunch, shell, fiber of the oil palm empty fruit bunch which they contain normal flora that can decompose cellulosic material; cellulolytic microorganism.

5.1.2 There were fifty eight (58) isolates of microorganisms isolated from the samples associated with oil palm industry. Thirty nine isolates (39) of microorganisms belonged to member of bacteria, ten isolates (10) was classified to be a member of actinomycetes while nine (9) isolates was classified to be a member of fungi.

5.1.3 The isolate 12.3.A was shown a high production of cellulase activity and reducing sugar than the other microorganisms when it degraded CMC, OPEFB and the residue of acid hydrolysis of OPEFB.

5.1.4 Optimal conditions of the isolate 12.3.A are pH 7, temperature 30^{o}C, 1% the substrate concentration and amonium sulfate is the best as a nitrogen source for OPEFB medium and peptone is the best as nitrogen sources for the residue medium.

5.1.5 Specific activity from ammonium sulfate precipitation was raised as 3.74 U/mg and for cellulase purification by dialysis was 7.38 U/mg.

5.1.6 Two bands of clear zone by zymogram method showed two enzymes of cellulase (endo-ß-glucanase) which were involved in the degradation of cellulose (CMC) on the surface of the SDS gel.

5.1.7 Optimum pH and temperature of cellulase activity for saccharification are pH 6.5 and 45^{o}C.

5.1.8 The initial concentration of reducing sugar for OPEFB and the residue medium were 1.77 g/L and 1.01 g/L while the optimal ethanol production from OPEFB and the residue as sugar sources were 0.76 g/L and 0.41 g/L at incubation times of 72 hours.

5.1.9 From 16S-rDNA analysis, The isolate 12.3.A have similarity 99% with *Streptomyces hirsutus* strain NRRL B-2713 after it created to a philogenetic tree by using Clustal X and Treeview software program.

5.2 Suggestion

5.2.1 In preparing the residue of acid hydrolysis of OPEFB should be careful to reduce lost of the yield of the residue fiber when the residue was washed by water for neutralization.