









TABLE 6: EFFECT OF BAP AND NAA ON IN VITRO CALLUS INDUCTION ON ROOT EXPLANTS OF *AVERHOA CARAMBOLA*

Treatment	Average weight of callus at week 8	Callus condition
0.0 mg/L BAP + 0.0 mg/L NAA	0.037±0.003	Brown
0.5 mg/L BAP + 0.5 mg/L NAA	0.279 ±0.070	Brown
1.0 mg/L BAP + 0.5 mg/L NAA	0.034±0.007	Brown
2.0 mg/L BAP + 0.5 mg/L NAA	0.033±0.008	Brown
0.5 mg/L BAP + 1.0 mg/L NAA	0.040±0.016	Brown
1.0 mg/L BAP + 1.0 mg/L NAA	0.032±0.006	Brown
2.0 mg/L BAP + 1.0 mg/L NAA	0.024±0.004	Brown
0.5 mg/L BAP + 2.0 mg/L NAA	0.043±0.007	Brown
1.0 mg/L BAP + 2.0 mg/L NAA	0.013±0.002	Brown
2.0 mg/L BAP + 2.0 mg/L NAA	0.010±0.000	Brown

Mean±SE, n=30. Mean is different significantly at p=0.5



Fig. 4 Combinations and concentrations of plant growth regulators (BAP and NAA) gave response to callus induction on *Averhoa carambol*

#### IV. CONCLUSION

In conclusion, *in vitro* regeneration of *Averhoa carambola* had been successfully obtained from explants culture on various combination and concentration of BAP and NAA. Two samples, one stem explant in BAP 0.5 mg/L and NAA 2.0 mg/L and one shoot explant in BAP 1.0 mg/L and NAA 2.0 mg/L successfully developed into complete plants.

For callus induction, it was observed that leaf explant produced the optimum callus when cultured on BAP 0.5 mg/L and NAA 0.5 mg/L medium. Meanwhile, shoot regeneration frequency was relatively low in this experiment. Healthy shoots developed in a stem explants in BAP 0.5 mg/L and NAA 2.0

mg/L and a shoot explants in BAP 1.0 mg/L and NAA 1.0 mg/L. Other the others hand, root formation was more prevalent in this experiment. Leaf explants cultured on BAP 1.0 mg/L and NAA 0.5 mg/L and stem explants in BAP 2.0 mg/L and NAA 0.5 mg/L (Figure 4.4) performed the best in forming functional roots. In the present study, it showed that *in vitro* regeneration of *Averhoa carambola* were influenced by two factors such as type of explants and different concentration and combination plant growth regulators used. Besides, other factors not under this study such as types of plant growth regulators [9] and [5] sources; age, size, and overall quality of the plant [6] will also affect the *in vitro* regeneration of explants.

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