

NOTE**Effects of Plant Growth Regulators on Rooting of Tea Cuttings (*Camellia sinensis*) Clone 100 Iran**

REZA AZADI GONBAD* and ALI FATEMI CHOKAMI

*Tea Research Institute of Iran, Shekh Zahed St., Lahidjan, Guilan, Iran**Fax: (98)(141)4225575; Tel: (98)(141)4224003**E-mail: azadi_g@yahoo.com*

A study has been carried out to evaluate root formation and growth in tea cuttings, clone 100 of Iran, soaked in solutions of some growth promoting substance such as indole-3-butyric acid (IBA) and 1-naphthalene acetic acid (NAA). An attempt has also been made to identify their optimal dosage. Rooting and plant growth parameters were improved when cuttings soaked in solutions of IBA and NAA than control. Mixture of NAA + IBA at 2000 ppm showed greatest effect than other concentrations.

Key Words: Tea cutting, Plant growth regulator, Rooting and Growth.

Tea is a self sterile perennial crop and requires cross pollination for setting up viable seed. The progeny raised through seed dose not produce true to type. Vegetative propagation is a successful and common practice to overcome variability in growth, yield and leaf quality of plants. The most desired and important factor in the selection of mother bush for vegetative propagation is its early rooting ability. For this purpose use of growth promoting hormones have a potent influence on the root initiation. There have been some interesting reports about the response of cuttings of tea to pretreatment with some growth promoting hormones. Rajaskar and Sharma¹ reported that mixture of IBA and zinc at 5000 ppm powder formulation proved to be superior to the rooting hormonal formulation based on IBA.

Kathiravetpillai *et al.*² found that soaking cuttings of a slow rooting clone in solutions of IBA and IBA + NAA were improved rooting and plant growth parameters. Venkataramani³ reported the effect of IAA, IBA and NAA on quality and quantity of produced roots. Malik and Harnard⁴ observed 100 % rooting with 1000 ppm IBA in cuttings of sour orange. The response of cuttings of tea to pretreatment with certain micro nutrients like zinc and boron has reported to be successful⁵.

The increasing demand for tea and the low productivity of exiting plantation justify intensive planting with elite clones. In recent years tea clone 100 of Iran has higher yields and productivity than other clones. It is also highly desirable elite clone for black tea production in Iran. Study about propagation and rooting of tea cuttings is lack in Iran thus the objective of this study was to evaluate the effect of plant growth regulator on rooting of tea cuttings clone 100 of Iran.

The study was carried out at Eftekhary tea research station, Fouman, Iran from June 2004 to July 2005. Old healthy tea bushes of clone 100 were pruned in 2003. Uniform single node cuttings of 2.5-3.0 cm long from new shoots were used for the experiment. The base portion (1.0-1.5 cm) of cuttings per treatment were soaked in alcohol 1000, 2000 and 3000 IBA and NAA; 1000, 2000 and 3000 IBA + NAA; 2000, 4000 and 6000 ppm zinc sulfate solution for 5 s. The treated cuttings were planted into the soil filled in polythene sleeves and placed under the coir matting tunnel. The filled pots were irrigated manually as needed during the experiment. Supplementary humidity was used to maintain a minimum humidity of 75 %.

The experiment was conducted in a completely randomized block with 3 replications. The plant were harvested at the end of 16 weeks and the growth parameters such as rooted cutting, number and length of roots per cutting and dry weight of root and stem determined. The data were subjected to analysis of variance using the ANOVA procedures of the SPSS program, following the significantly F, Tukey's Multiple range test was done.

Number of survival cuttings: The results showed that survival percentage of rooted cutting were significant in 3000 ppm NAA than other treatments ($p < 0.001$) (Fig. 1). Nasser *et al.*⁶ reported that with slow method more number of cutting were rooted in 80 ppm IBA.

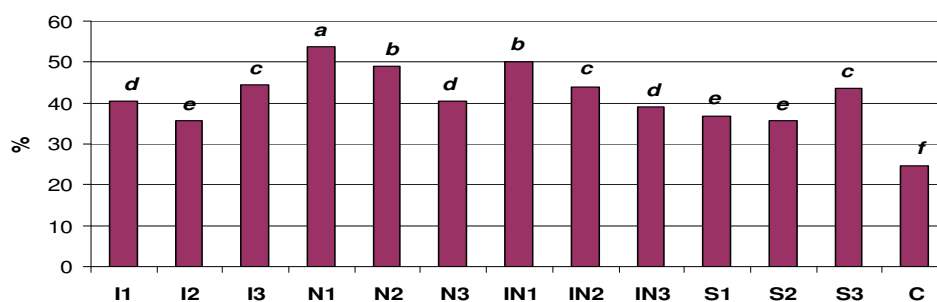


Fig. 1. Effect of plant growth regulator on survival of tea cutting

Length of roots and stem: The mean length of roots of cutting treated with 3000 ppm IBA increased at greater extent as compared to other treatment and control (Fig. 2). However, no significant difference was observed between 3000 ppm IBA 1000, 2000 ppm NAA and 1000 ppm IBA + NAA and 4000 ppm zinc sulfate. The tendency in increase of mean length of stem was almost similar to that of the length of roots.

Dry weight of roots and stems: The greater dry weight of roots observed in 3000 ppm IBA treatment. No significant difference found between control and 3000 ppm IBA + NAA and 3000 ppm NAA of cuttings (Fig. 3).

In the case of dry weight of stem, the cutting treated with 1000, 2000 NAA, 1000 ppm IBA+NAA, 6000 ppm Zinc sulfate had not shown a significant different with respect to control treatment.

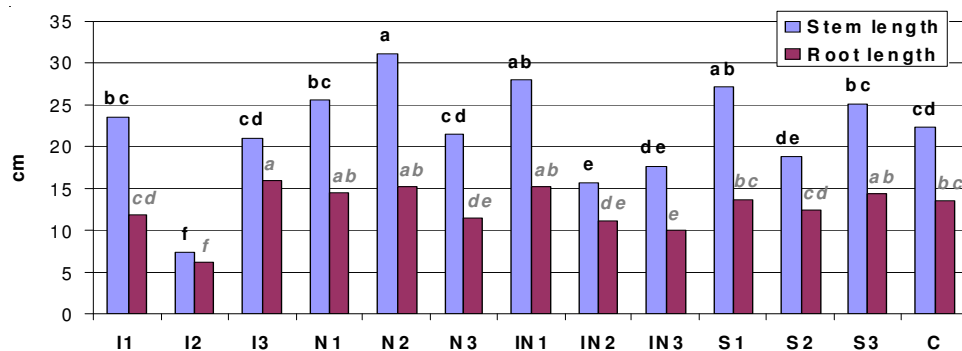


Fig. 2. Effect of plant growth regulator on stem and root length of tea cutting

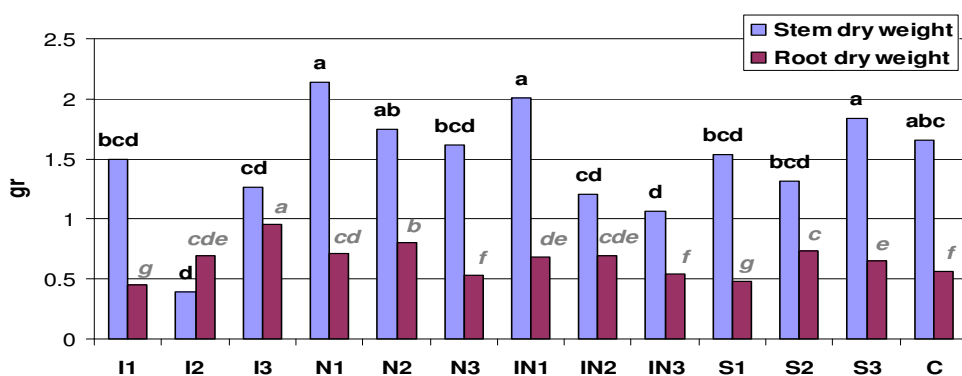


Fig. 3. Effect of plant growth regulator on stem and root dry weight of tea cutting

Kathiravetpillai *et al.*² found greater dry weight of roots in 80 ppm IBA treated cuttings. However, Nasser *et al.*⁶ reported that no significant difference was seen among root dry weight in all cutting treated with some growth promoting hormones.

In conclusion, according to present results, use of plant growth regulators has significantly effects on growth parameters of tea cuttings.

REFERENCES

1. R. Rajaskar and V.S. Sharma, *Sri Lanka J. Tea Sci.*, **58**, 25 (1984).
2. A. Kathiravetpillai, V. Shanmugarajah and S. Kulasegaram, *Hort. Abstr.*, **55**, 21 (1983).
3. K.S. Venkataramani, Report of the Botanist for 1958 A.R. UPASAI. Sci. Dep. Tea. Sect, pp. 114-115 (1958-59).
4. M.N. Malik and H.E. Hanard, *Pak. J. Agric. Res.*, **4**, 174 (1983).
5. K.S. Venkataramani, Rooting of Tea Cuttings as Influenced by Treatment with Boron and Indol Butyric Acid, Ann. Admin. Rep. UPASI Sci. Dep. For 1961-62, Appendix 37-39 (1962).
6. A. Nasser, F.S. Hamid and A. Waheed, *Tea J. Bangladesh*, **28**, 16 (1992).