
SUMMARY AND CONCLUSION

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Phyla nodiflora formerly called Lippia nodiflora has a wide range of adaptation to saline soil phase (Karadge et.al. 1983). It is also known to grow on the border areas where waterlogging takes place through seepage of water takes place along canals and bunds. This plant possesses salt glands indicating that it is able to pump salt that it picks up from the soil. This has been evidenced by anatomical studies. The foregoing investigation therefore (~~of~~ Phyla nodiflora) have been studied for mechanism of salt exudation through salt glands under culture conditions of soil sand and liquid medium. The plants have been exposed to these substratum to increasing concentration of salt from 50 mM to 300 mM with a gap of 100 mM. After establishing the plants in above culture conditions, the amount of salt exuded from leaves in day time has been monitored and quantified. The culture condition is correlated with the salt exudation.

The salt glands have been anatomically studied to compare the structure with the typical salt glands of hitherto to known plants.

With a view to studying its ecological adaptation to the conditions of salt stress as well as water stress in form of water logging, so that eventually its genetic system for these characteristics can be identified. This plant has also been exposed to water logged condition. The plants were given water logging treatment through soil in the pots as well as through Hoagland in the culture flasks. The effect of waterlogging on aerenchyma formation and its correlation with cellulolytic activity as could be evidenced by release of cellulase in the tissue have been studied at different time intervals.

The methodology employed in the above study is a routine type. The salt treatment has been given as per standard U.S.D.A. technique. Liquid culture was raised in Hoagland. The enzyme cellulase was assayed as per the method described in the Bergmayer. Stomatal index and the gland index have been studied by conventional methods found in the text book.

FINDINGS :

The highlights of the findings are as follows :

1. The salt glands found in the Phyla nodiflora can be classified similar to that of Spartina and Linonium.
2. The amount of salt secreted per day per leaf varied with the culture practices.
3. Under pot culture condition the exudation rate increases linearly with the concentration of NaCl of ambient. Maximum being 1.82 mM per Litre at 300 mM NaCl at the root zone.

4. The exudation rate change when plants were culture in the sand with Hoagland maximum exudation is 1.5 mM/Litre is at 150 mM NaCl ambient.
5. Salt exudation rate through gland when cultured in Hoagland under liquid culture condition changed the rate of exudation is inversely proportional to increasing concentration of NaCl ambient. At 50 mM ambient NaCl exudation is 2 mM per litre which slowly and antiparallely decreased to 0.83 mMol per litre at concentration 300 mM NaCl ambient.
6. The Phyla nodiflora is amphistomatal in nature show stomatal frequency in the upper and lower epidermis is in conformative with many halophytes studied. The stomatal index is in proportion with that of stomatal frequency i.e. low in upper epidermis and high in the lower epidermis.
7. The salt gland index as expressed number of glands proportion to the number of epidermal cells per mm^2 has also been calculated which is shown to be 5.0 in the upper epidermis and 5.9 to the lower epidermis.
8. Cellulase activity in root, stem and leaf has been assayed in pot culture, endogenous cellulase activity in the root is 6.2 in stem 6.54 and in leaf 5.2.
9. Cellulase activity under waterlogged condition assayed in three organ revealed that with the increase in time-lag the activity increases. The more activity is seen in stem rather than roots. This revealed the enzyme induction is brought by the waterlogged condition.

10. Phyla nodiflora when culture in sand under water stress gave a positive test for existence of cellulase both in roots and stems.
11. The overall conclusion drawn is - Phyla nodiflora has genetic endowment both for salt tolerance as well as toleranc^e to waterloged^d condition. In other words it is best adopted to both the conditions.