Blue-green algae by now have been recognised as an important group of microorganisms which quietly and unobtrusively, contribute to the success of life on this planet. Whether as major producers of life-sustaining oxygen or as biological fertiliser or even as food, cyanophytes, as blue-green algae are technically known, are uncomparable, gaining more and more importance in today's modern, industrialised world. Their procaryotic cellular organisation and the ease with which they survive extremes of environments make them an interesting group from the viewpoint of scientific research.

Cyanophytes along with fungal mycelia comprise the bulk of microorganisms present in the algal crusts which occur on soil surfaces (Booth, 1941; Fletcher and Martin, 1948). A review of literature concerning conditions governing growth and distribution of terrestrial algae has been published by Shields and Durell (1964). Later on, attention has been given to algae of arid and semi-arid soils mainly because they are the most abundant group of photoautotrophs present therein and that too, when no other chlorophyllous plants are evident (Chantanachat and Bold, 1962; Cameron and Blank, 1966); these studies were mainly taxonomic and covered deserts of Arizona, Utah, Israel, Saudi Arabia,
Mexico and some other arid zones of North America.

Blue-green algae are known to survive in extremes of temperatures (in hot springs and cold, ice-bound habitats). Probably, 20% of these algae inhabit saline situations, majority of which are truly marine (Desikachary, 1959); they are classified as halophilic (for those surviving in highly concentrated brines) and halotolerant (for those not occurring in cultures with salt concentrations above 2 M).

Aphanthece halophytica and Anabeena torulosa belong to the former group while others, such as species of Oscillatoria, Microcoleus, Phormidium and Anabaena comprise the halotolerant group (Desikachary, 1959).

While studying the effects of salinity on a marine diatom, Cyclotella cryptica, Liu and Hellebust (1976 a) stated that salinity is an important ecological variable whose fluctuating concentrations may be affecting growth, metabolism and survival of organisms. However, physiology of halotolerance, the consequent water stress and its ionic-cum-osmotic effects have mainly been studied for higher, eucaryotic plants; this is evident from the innumerable publications and well-researched monographs (Yen-Zioni et al., 1967; Kahane and Poljakoff-Mayber, 1968; Weimberg, 1970; Kozlowski, 1972; Greenway, 1973); even these studies were considered scanty and contradictory by Greenway (1973) adding that salt tolerance
and growth responses to salinity differ greatly in different species.

Admittedly, there has been a lot of work concerning the enzymology, nitrogen metabolism and other metabolic aspects of blue-green algae. This is evident from the three excellent monographs (Lewin, 1962; Carr and Whitton, 1973; Stewart, 1974). But reports of cyanophycean physiology as affected by salinity are sketchy; this is all the more conspicuous when compared with similar studies on another group of procaryotes, the halophilic bacteria (Baxter, 1959; Christian and Waltho, 1962; Reistad, 1970; Lanyi, 1974).

It was in 1952 (Gerloff et al.) and later in 1955 (Kratz and Myres; Allen and Arnon), that reports were first published to signify the importance of sodium to the nutrition and growth of some blue-green algae. Batterson and Van Baalen (1971) studied growth responses of some marine and freshwater blue-green algae to sodium chloride. Apte and Thomas (1974) examined the ability of a nitrogen-fixing cyanophyte to grow under saline conditions and also, the kinetics of sodium uptake. Effects of sodium and potassium chloride on blue-green algal growth were also reported by Ward and Wetzel (1975). Yopp et al. (1975) reported the effects of osmoticum and substrate concentrations of on glucose-6-phosphate dehydrogenase from the obligately halophilic blue-green
alga, *Aphanathece halophytica*; for the same species, Tindall et al. (1977) reported salt effects on its nitrogen metabolism which, in their opinion, was the first publication of its kind. Talpasayi and Rao (1979) has published a brief paper on physiology of salt stress on certain cellular constituents of a brine alga, *Anabaena fertilissima*.

How important are cyanophytes to the fertility of saline soils? Recent work throws some light on this question. Singh (1950) observed that cyanophytes grew successfully on arid, saline soils of India, where most plants, with the exception of halophytes fail to grow. This is important because algae are known to add organic matter like carbon, amino- and other nitrogen compounds either during their life time or after death and decomposition; many species of blue-green algae are confirmed nitrogen fixers. Stewart and Pugh (1963) noted that perhaps a third of the heterocystous species of blue-green algae isolated from a salt-marsh were likely to be nitrogen-fixing types. Stewart and Lex (1970) suggested that under salt-marsh conditions, the importance of even non-heterocystous forms, which may fix nitrogen under 'microaerophilic' conditions, is enhanced. Thomas (1977) has advocated growing of cyanobacteria, adapted to thrive on soils rendered saline due to bad farm management; he observed a 25-30% decrease in salinity after
treated such soils with repeated cultivation of A. *torulosa*, a nitrogen-fixing form. Thus, the contribution of terrestrial cyanophytes to the fertility of arid, saline soils becomes a single most important reason for an in-depth study of their physiological and metabolic status as affected by external environments, especially salinity.

It becomes apparent from the entire forgoing account that as far as NaCl-salinity and physiology of halotolerance is concerned, algae in general and terrestrial cyanophytes in particular have been given only a perfunctory glance by biologists; this lapse is more conspicuous in view of the known importance of these microorganisms to the fertility of arid, saline soils as discussed above.

Such a lacuna in algal physiology is too big to fill up in the present context. A small attempt however, has been made during the present investigation, to understand the growth characteristics, protein and amino acid metabolism and certain enzyme activities in a terrestrial blue-green alga, *Phormidium ambiguum* Gomont as affected by external concentrations of sodium chloride.