Betelvine (Piper betle Linn) is a perennial, evergreen, dioecious shade loving creeper commonly known as Paan, belongs to the family Piperaceae. The crop is most probably native of Malaysia (Chattopadhyay and Maity, 1990) and commercially cultivated for its economic leaves used as masticator for chewing purpose in many parts of the world especially in the tropical and sub-tropical countries. Every part of the vine has high medicinal value and several attributes such as ‘digestive’, ‘carminative’, ‘stimulant’, ‘antiseptic’ and ‘antifungal’ activities have been described. A phenolic compound, hydroxyl-chavicol, with anti-carcinogenic property has also been identified in betel leaves (Verma et al., 2004). The significance of leaves has been explained in the ancient literature in relation to every sphere of human life including social, cultural, religious and even day to day life, which is very much relevant even this day (Guha, 2006). In fact, this edible leaf has achieved an esteemed position in the human society right from the dawn of civilization, particularly in the countries like Bangladesh, Burma, China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, South Africa, Sri Lanka, Thailand etc. (Samanta, 1994; Sharma et al., 1996) where the leaves are traditionally used for chewing in their natural raw condition along with many other ingredients like sliced areca nut, slaked lime, coriander, aniseed, clove, cardamom, sweetener, coconut scrapings, jelly, pepper mint, flavouring agent, fruit pulp etc. (Anonymous, 1969).

The vast economic potentiality of the crop can be adequately established by the fact that about 15-20 million people consume betel leaves in India on a regular basis (Jana, 1996) besides this in other countries of the world which may include 2 billion customers (Jeng, 2002). The area under cultivation in India is more than 55,000 hectares with annual turn over of Rs. 9000 millions every year.

In West Bengal the crop is grown in almost all the districts except the hilly tract of Darjeeling and dry areas of Bankura and Purulia districts. Lakhs of farm-families of the coastal districts like 24-Parganas (north and south) and Midnapur East are solely depend on the crop for their livelihood. On an average about 66% of production is
contributed by the state of West Bengal where it is cultivated on about 20,000 ha encompassing about 4-5 lakhs boroj. The crop provides a National Income to the tune of 6000-7000 million every year providing livelihood to 25 million farm families of the country and at the same time it also provides an income of Rs 800-1000 million to the state of West Bengal. Betel leaves worth about Rs 30-40 million are exported to the Middle East and European countries (Guha, 2006) indicating the foreign exchange earning potentiality of the crop, which is required to be strengthened in the interest of the nation and can be achieved only through research.

There is wide diversity in exomorphic characters of betelvine germplasm grown in India which is still unexplored due to absence of scientific breeding programme and low level of characterization. The systematic collections of the existing germplasm were started only after the inception of All India Co-ordinated Research Project on Betelvine. The collections so far made since 1981-2000 were listed with their local names and collection sources as provided by the participating centres and duplication of the cultivars with different names were very common. Sometimes the same variety is known by different names in different areas and which is very common in case of Bangla type. Identification of variation needs to be analyzed to find out better germplasm and which will help in further selection process. The importance of genotypes x environment interaction (G x E) has been recognised from very beginning especially in the crops like betelvine where environmental fluctuation play a vital role in its seasonal production and productivity (Rahaman et al., 1997).

The economic part of the betelvine is green, tender and fresh leaves. So, the nutrients, particularly nitrogen requirement of the crop is very high. On the other hand, application of large amount of nitrogenous fertilizers invites leaf diseases, pest infestation and negatively influences the keeping quality of the leaves. Most of the betelvine growers supplement this high amount of nitrogen requirement through oil cakes and balanced application of fertilizers are rarely practiced. Maity (1989) reported that the application of 200 kg N, 100 kg P₂O₅ and K₂O per ha per year for better growth and yield of vine under West Bengal condition.

The main constraint of betelvine cultivation is its susceptibility to various diseases often causing huge economic loss to the farmers. The moist humid shaded condition favourable for crop growth also favours disease development. The practice of consuming raw leaves makes the situation further complicated for application of plant protection chemicals even after using non-toxic chemicals in traces with extra caution. Only
biological means of disease management of the fatal diseases can remove the health hazards. In the modern day agriculture, the concept of integrated nutrient management has emerged with combination of organic and inorganic sources of fertilizers for quality production. Biologicals are also given emphasis for easy nutrient availability and protection against certain diseases.

Integrated nutrient management involving balanced use of organic and inorganic fertilizers coupled with application of bio-control agent may prove beneficial for achieving a cost effective and eco-friendly nutrient management schedule.

A larger section of the people of the northern districts of the West Bengal is regular chewer of betel leaves. However, due to non availability of improved variety and lack of proper management practices, the huge market is dependent on the supply received from the southern districts of West Bengal.

Keeping this constrains in mind the present investigation was undertaken to study the following objectives.

- Screening of 12 different germplasm of betelvine suitable for cultivation under Terai zone of West Bengal.
- Validation of integrated nutrient management system for production of quality betelvine leaves.
- To find out the effect of different organic amendments, bio-fertilizers and bio-pesticides for enhancement of leaf quality and management of important diseases of betelvine.