INTRODUCTION

Vanilla flavour is highly preferred all over the world in food and beverage industry. Vanilla fragrance is highly valued in perfumery. Vanillin (4-hydroxy 3-methoxy benzaldehyde) is the major chemical responsible for vanilla flavour and fragrance. Natural vanillin is preferred over synthetic vanillin eventhough it is highly expensive. Compounds like vanillic acid, vanillyl alcohol, para hydroxy benzaldehyde, para hydroxy benzoic acid, etc. also contribute towards the uniqueness of natural vanilla flavour. Only a very small percentage of the vanillin consumed annually is obtained from natural sources (Ramawat and Merillon, 1999). The remainder is produced synthetically mostly from petrochemicals and rarely from lignin (Clark, 1990). However, flavouring agents and food additives from natural sources are nowadays becoming popular rapidly due to the increasing awareness on health hazards caused by synthetic food additives.

Natural vanillin is obtained from three cultivated species of the orchid genus Vanilla namely Vanilla planifolia Andrews, Vanilla tahitensis J.W.Moore and Vanilla pompona Schiede. Of these, Vanilla planifolia is the most preferred and widely cultivated (Purseglove et al., 1981).

The vanilla plant is essentially monopodial in habit and the growth of the plant is accomplished by elongation from the apical meristem and the growth is indeterminate. With its vining habit and production of one root from each node it can climb many feet to the top of support plants (Withner et al., 1974).
*Vanilla planifolia* is native to the humid tropical rain forests of South Eastern Mexico, Central America, the West Indies and the northern part of South America. *Vanilla tahitensis* is indigenous to Tahiti, the French Oceania group of islands in the Pacific Ocean and *Vanilla pompona* is indigenous to South Eastern Mexico, Central America, Trinidad and North and South America (Correll, 1944; Purseglove et al., 1981).

In India only *Vanilla planifolia* is cultivated commercially. *Vanilla tahitensis* and *Vanilla pompona* are available in the germplasm repositories of the national institutes carrying out spices research in the country (Ravindran, 1999; Kuruvilla et al., 2004; Bhat and Sudharshan, 2004).

Attempts to introduce vanilla to India dated back to 1835 (Correll, 1953). However commercial cultivation of vanilla in India started by the end of the 19th century (Anonymous, 1992). The genetic base of vanilla in India is very narrow since vanilla cultivation most probably started in the country using very few cuttings introduced for the purpose (Anonymous, 2000).

Natural vanillin is obtained from the processed beans obtained from the commercial crop. Vanilla vines usually come to flower 4-5 years after planting. Inflorescences are axillary and they usually produce 20-25 flowers (Kuruvilla et al., 1996). Artificial pollination is necessary for fruit setting in the cultivated field. The ovaries of pollinated flowers develop into fruits and the fruits mature by about nine months. At maturity the beans are harvested and processed to convert the precursors of vanillin present in them to vanillin (Purseglove et al., 1981).
Different methods of processing (curing) of vanilla beans are used in different vanilla growing areas. However, the bourbon method of curing is the most popular (Krishnakumar et al., 2003).

Being an introduced and clonally propagated crop the genetic base of vanilla in India is very narrow (Anonymous, 2000). Preliminary investigations on exploration, collection and conservation of Vanilla planifolia in India have indicated the need of systematic efforts to assess the variability of vanilla both at in situ and ex situ levels and also efforts to study agronomical characters of the crop based on a crop improvement perspective. The objectives of the present experiment have been formulated from the above situation that demand studies that lead to the improvement of the planting materials that are made available to the farmers and also studies on the crop for further investigations on its genetics and genetic improvement.

The major objectives envisaged presently include study of the floral biology of two cultivated species of vanilla; study of interspecific variability between them; study of field level variability of Vanilla planifolia, the species commercially cultivated in India; study of its genetic variability, interrelationship of characters, character association and genetic divergence and also a study on the adaptability of Vanilla planifolia to different geographical regions of Kerala State of India.

The dawn of the twenty first century witnessed rapid popularization of vanilla in South India, especially in the State of Kerala. Even though unpredictable fluctuations in the price of the crop have recently resulted in adding fuel to the anxiety in the minds of farmers, the role of the crop in providing supplementary income especially to the small
and marginal farmers cannot be neglected. Ensuring the availability of consistently good yielding planting material is of utmost importance and hence efforts have been made presently to screen the available germplasm so as to identify superior genotypes.