ABSTRACT

Fruits and vegetables play unique role in developing countries like India in economic and social spheres for improving the income and nutritional status of the rural people. They are not only used for domestic consumption and processing into various products but also substantial quantity exported in fresh and processed form, bringing much-needed foreign exchange for the country. Fruit and vegetable crops also provide ample scope for maintaining ecological balance and to create sustainable agriculture and can make an impact on national economy of the country. Though there is a rapid expansion of the area under the cultivation of fruit and vegetable crops in India, from 8.47 million hectares with a production of 87.16 million tonnes during the years 1991-92 to the current area is 16.18 million hectares with an annual production of 243.46 million tonnes during the year 2012-13 whereas in Arunachal Pradesh, total area under fruits and vegetables crops is 81.40 thousand hectares with an annual production of 218.00 thousand tones.

India stands second largest producer of fruits and vegetables in the world and they play unique role in developing countries like India in economic and social spheres for improving the income and nutritional status of the rural people. Fruits and vegetables, besides providing nutritional security, are also major source of income especially for small and marginal farmers. Newly developed short duration varieties of vegetables crops like cabbage, tomato, potato, pea, okra etc. fit in the rice based cropping system of this state and thereby the cropping intensity can be increased many fold to fulfil the growing demand and can improve the economic condition of the growers as compared to cereal crops in the state.

Fruits form a complete, wholesome food for the grown up, still growing and the invalids alike, leading to healthy body and mind. It is a ready source of energy with the unique capacity to guard against many deficiency diseases. Fruits, fresh or dried have been natural staple diet of human being since ancient times, and contains minerals, vitamins, enzymes that are easily digestible. They are not only good source as food; they are also used as medicine to heal various ailments. It can supply more than one third of the total requirements of calories, vitamins and minerals to humankind. With the active participation of plant scientists it should not be difficult to
meet the requirement of our needs of fruits. Therefore, more stress need to be laid on the relationship of the physiology of the plant with cultural practices.

Vegetables, besides providing nutritional security, are also major source of income especially for small and marginal farmers of Arunachal Pradesh. Newly developed short duration cultivars of vegetables crops like cabbage, tomato, potato, pea, okra etc. fit in the rice based cropping system of this state and thereby the cropping intensity can be increased many fold. Besides the vegetables, crops give more yields per unit area, more labour incentives, more remuneration, can improve the economic condition of the growers as compared to cereal crops in this state. Keeping above importance and need in view, a systematic study was carried out with the aim of documentation of fruit and vegetable crops, and physico-chemical characteristics analysing productivity and nutritional quality of selected crops in Papum Pare district of Arunachal Pradesh.

Based on the agro-climatic variability in account present study was conducted in Papum Pare district of Arunachal Pradesh situated between 26°55’ to 28°40’ N latitude and 92°40’ E to 94°21’ E longitude covering total geographical area 2,875 km². Three such sites were selected for local and improved cultivars each. Documentation of fruits and vegetables was done through questionnaire/field survey in selected areas. Sites were selected keeping agro-climatic conditions in view. Random sampling was done in select villages (average 4 to 5 villages) from each agro-climatic condition. Age group of 18-70 years was chosen for gathering the information on fruits and vegetables. Secondary information from the published sources was also taken into consideration. Traditional cultivation methods were recorded through personal interview with the selected farmers and by visiting their cultivation fields in the present studies. Physical parameters such as size, fresh weight, yield, moisture, dry weight and specific gravity of fruits and vegetables were studied following standard method described by Ranganna (1986) and A.O.A.C (1984). Bio-chemical parameters like protein, fat, crude fiber, carbohydrate, vitamin C, riboflavin, thiamine, calcium, phosphorus, iron, sodium was estimated.

A total of 36 fruits and 48 vegetables species were recorded from the study area. Brassica was most dominant genus and majority of genera were represented by
single species. There were not much variation among local and improved cultivars in moisture and dry weight content. Utilization pattern (vegetables) for parts used revealed that large numbers (34.5%) of species are used as fruit/seed followed by leafy components, root/rhizome/bulbs, etc. For fruit species, 30.46% species are used as fresh and juice and 13.22% as medicinal values. 27% fruits species are used as firewood/fodder. It has been found that fruits and vegetables are also utilised for other purposes such as medicine, firewood and fodder are the main. It has been found that fruits and vegetables are also utilized for other purposes such as medicine; firewood and fodder is the main.

All vegetables recorded relatively higher fat content than the fruits and improved cultivars have better fat content except aonla and papaya. Carbohydrate content was greater in aonla, followed by pineapple and pummelo cultivars. However, not significant variations in carbohydrate content are recorded between the cultivars. Vitamin C content was also found greater in both cultivars of aonla. Among the vegetables, all indigenous cultivars expressed higher vitamin C. Thiamine and riboflavin contents were generally higher in local cultivars than the improved cultivars. Improved cultivars of fruits and vegetables showed higher yield, mainly due to their size and weight. Statistical analysis (t-test) of the data resulted that significant variation are observed in size and fresh weight among the local and improved cultivars. Significant variation is also recorded in diameter of local and improved cultivars except okra. Significant variation observed in Yield except pineapple and pummelo. Non-significant variation are observed in specific gravity, moisture, dry matter, fat, fibre, carbohydrate, vitamin C, thiamine, riboflavin, calcium, iron content among the cultivars. Non-significant variation was also observed in protein except papaya cultivars and in phosphorus except pineapple cultivars.

Based on the present research findings, it is concluded that, improved cultivars showed impact on various physical, bio-chemical and yield parameters, however, statistically most of variations are non-significant (except few parameters). Non-significant variation could be due to non-adaptation of the improved cultivars in the area, non-favourable site characteristics (soil, climate), poor management etc. Improved cultivars may be promoted for area specific in which local cultivars may play a key role in improvement (cultivars) programme. It is being suggested for
further intensive study through consistent crop improvement process to acclimatize
the crops to different edapho-climatic regime to standardize sustainable production
mechanism. This is particularly important for state like Arunachal Pradesh, which is
geologically young, ecologically fragile and facing challenges of sustainable
production of fruits and vegetables among different agro-ecological settings. Findings
of the present research are helpful in selecting the economical crops for better yield in
given crops for socio-economic growth and poverty alleviation of Arunachal Pradesh
in particular and northeast India in general.