INTRODUCTION
*Guizotia abyssinica* is an annual herbaceous oil producing plant belonging to the family Asteraceae. It is a native of tropical Africa and widely cultivated in Ethiopia, Rhodesia and India. Niger seed is one of the minor oil seeds cultivated in India. It is mainly grown in Orissa, Madhya Pradesh, Maharashtra, Bihar, Karnataka, Gujarat, Andhra Pradesh and Tamil Nadu. Orissa has recently overtaken Madhya Pradesh as the chief niger producing state with 37.8 per cent of the total Indian production (Report of 21st All India Convention of Oil Industry & Trade, Hyderabad - Nov. 1983).

The seeds are black, shining without pappus and yield oil commonly known as "niger seed oil". The oil is pale yellow in colour with sweet odour and pleasant nutty taste, however, on storage at room temperature for more than six months, the oil may thicken and become rancid (Seegler, 1983). In India, niger seed oil is used as an edible oil, besides being used in paints and soap industry and as an illuminant. The low grade niger seed oil is used as an adulterant in sesame and mustard oil. The "niger cake" has 30% protein (Chavan, 1961) and is used as animal feed inspite of moderate levels of methionine and cystine, low level
of lysine and negligible tryptophan content. Niger seeds are exported on large scale from India to Western countries as a good bird-feed ingredient either pure or mixed (Economic Times, Ahmedabad, Oct. 16, 1992). Niger cake is also used as an organic fertiliser (Seegler, 1983). The whole plant is sometimes used as fodder or as green manure.

In India niger seed crop is normally grown on light, gravelly shallow soil and is generally planted after the rainy season is well advanced. The crop matures in 75 to 150 days depending upon elevation of the land and sowing dates. Branching begins from the upper nodes at 6 to 8 leaf stage and two to three buds are formed close together at the tip of the branches, followed by the formation of buds in the axils of the leaves. The plant is highly branched, has a well developed tap root system and attains a height between 35 to 200 cms. A single plant bears about 20–40 flowering heads. Flowering begins 50–110 days after sowing and can continue for 4–6 weeks in the field (Riley & Baleyneh, 1989).

Selection of improved varieties has been taken up and eleven improved varieties have been recommended (Chavan, 1961) for cultivation in India. The IGP-76 and the Ootacamund 5 varieties are widely adapted and recommended for cultivation in
several states, whereas, other varieties are recommended for cultivation within a single state.

India is one of the largest importers of edible oil in the world at the moment. The country imported edible oils worth as much as Rs 170 Crores in 1991-1992. The local production of oil from the conventional oil seed plants like ground nut, soya bean, cotton seed, palms etc. falls much below the targeted needs of growing population. It is therefore imperative for the country to search for alternate sources of edible oils from the rich reserves of plants in the country to become self sufficient. As niger seed oil is already being used to some extent for edible purposes in many parts of India, a detailed investigation of the plant which produces this oil can be useful in our search for self sufficiency.

The niger seed oil has not been studied to a great extent in India or abroad. Only a few attempts have been made to study macro and micro morphology of vegetative and reproductive organs of the plant so far. Few reports exist on the analysis of niger seed oil. Oil content of niger seeds is reported to range from 39 to 47 percent (Nema & Singh, 1965). Niger seed oil is rich in linoleic acid (45-60 per cent) which is one of the essential fatty acids for human nutrition. Niger seed oil has
anti-arterio sclerosis properties. The high percentage of linoleic acid in edible fats and oils helps in lowering cholesterol levels and reduces the risks of heart attack. The niger seed oil also contains a little amount of linolenic acid (0.9 per cent) which represents another essential fatty acid (Chin Wu Hsuch Pao, 1977).

The cake of niger seed is equivalent to ground nut cake in its crude protein content and has more methionine than ground nut cake. The cake therefore can be used for poultry as well as for animal feed.

The use of growth regulators and inhibitors has been judiciously employed to manipulate the growth of plants at vegetative and reproductive stages to increase the productivity of a number of crops. Investigations on the effect of growth regulators and inhibitors on the morpho-histogenic, physiological and biochemical parameters of niger seeds can probably help in increasing the production and productivity of niger seed oil and thus, accomplish successfully the search for alternate sources of edible oils. It may be possible to improve the percentage of oil content, seed size, number of seeds per head and other yield characteristics by manipulating the growth of the niger seed plant at vegetative and reproductive stages. Such studies can also fill
the lacunae in our knowledge regarding the biochemical, physiological, morphological and histogenic aspects. A detailed in depth study of *Guizotia abyssinica* Cass. was therefore undertaken to assess the potentiality of this crop as an alternative source of edible oil.