

## PHYSICAL AND CHEMICAL ANALYSIS OF SEEDS OF OOTAKMOND : A NEW VARIETY OF NIGER.

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During the present investigation physical and chemical properties of Ootakmond Variety of niger seed have been studied in detail. The results indicate that niger seed is rich in protein, fat and carbohydrate contents which are important gradient of food.

**Keywords :** Ootakmond variety; Niger seed, Physical analysis, Chemical analysis, Protein, Carbohydrate.

Niger (*Guizotia abyssinica*) is cultivated as an oilseed crop in many states in India. Madhya Pradesh alone has about 50% (30,00,000 acres) of the total acreage of India under niger production. Among several niger varieties developed for different niger growing states; Ootakmond variety has been found suitable for M.P., Orrissa, Maharashtra and Karnataka. Yield potential of this variety is about 500 Kg/hac. and seed has about 42% oil (I.C.A.R., 1984). Since no work has been done on the physical and chemical analysis of Ootakmond variety of niger, the present work was undertaken for detailed studies.

The seeds of Ootakmond variety of niger were obtained from Agricultural research farm station of J.N.K.V.V., Jabalpur, located at Chhindwara. One Kg of clean niger seeds were taken for

analysis of various physical and chemical studies.

### Analysis of Physical Properties

**Seed weight :** 1000 seeds were weighed and the weight of a single seed was calculated.

**Seed Length and Breadth :** Total Length and breadth of ten seeds of homogenous size were measured and length and breadth of one seed was calculated.

**Length/breadth ratio :** It was obtained by dividing the mean length of ten seeds by mean breadth of same number of seeds.

**Volume and density of the seeds :** One g. seeds were taken in a measuring cylinder of 10 ml having a known sufficient amount of water for total

absorbing capacity of seeds taken. The increase in volume of water was recorded. Density was calculated by dividing the volume by total volume thus obtained.

**Germination percentage :** One hundred niger seeds were spread in a petridish having a filter paper soaked with distilled water at room temperature for three days. The germination percentage was calculated by counting germinated seeds.

**Bulk volume of seeds :** Volume of one g. seeds was measured as mentioned above and expressed in terms of ml/g. seeds.

**Bulk density of seeds :** The bulk density was expressed in terms of w/v where

w = The weight of a seed.

v = The volume of a seed.

**Specific gravity :** The specific gravity was measured by the following formula-

$$\text{Specific gravity} = \frac{\text{Density of Material}}{\text{Density of water } 4^{\circ}\text{C}}$$

**Analysis of chemical properties-** For estimation of moisture : Estimation of moisture, crude protein, crude fat, total ash and crude fibre was done by the method of A.O.A.C. (1965).

Results of physical properties like test weight, length, breadth, length/breadth (L/B ratio) specific gravity, volume, density, bulk density, bulk volume and germination percentage are summarized as follows :

Test weight of 1000 niger seeds was 4.034 g. The average length and breadth of ten seeds was 4.5 cms. and 1.2 cms., respectively. However, L/B ratio was found to be 3.75 cms. The specific gravity of the seeds was 1.02 and volume of 10 gm of seeds was 10 cc with a density of 1 g/ml. Bulk density was found 1.0 whereas bulk volume was 1 ml/cc. The germination percentage of tested seeds was 60%.

The present study was undertaken to obtain the base profile of the physical characters of Ootakmond variety. Since there are no information available on these parameters except the test weight of seed (Singh and Verma, 1975) thus results could not be compared. However, the results of the present study on test weight are in agreement with the findings of earlier workers (Nema and Singh, 1965; I.C. A R. report 984 and Chaudhary, 1985) The values reported by Singh and Verma (1975), were relatively lower (3.38 to 3.46 g) as compared to the present value.

Results of various chemical properties showed that the niger seed contain about 3.62% of moisture. The crude protein content was recorded 27.5% with a value of 7.9% of fibre in them. The total ash content was found 4.7% and crude fat content was 3.12%. The total carbohydrate (by difference) content was 20.8%.

The moisture content recorded in this investigation was found similar to the values recorded by many other workers (Kulkarni and Oblisami, 1973;

Ramakrishna *et al.*, 1973 and Chaudhary, 1985. However, some workers reported moisture content ranging between 1.7 to 4.2% (Aykroyd and Gopalan, 1966 and Nasirullah *et al.*, 1982). Crude protein was similar to that of the previous observations (Kuppuswamy *et al.*, 1985 and Khidiro and Ahmed, 1975). However Nasirullah *et al.*, (1982) observed that the protein content of niger seeds changed with the locality and ranged between 26.0 to 30.6% whereas Sharma and Mishra (1978), reported higher protein content in Ootakmond variety ranging between 22.29 to 40%. The finding of other workers are also in agreement with the above values and ranged between 25.22 to 44% (Ramakrishna *et al.*, 1973 and Kachapur *et al.*, 1981). The variation in the values of protein content might be due to difference in agronomical practices like date of sowing, period of maturity, insect and disease control etc.

Total ash content was in agreement to the findings of Sharma and Mishra (1978). They have reported 4.5% ash content in the seeds of Ootakmond variety. Several other workers have also reported the values of total ash content in different varieties of niger seed which ranged between 3.8% (Ramakrishna *et al.*, 1973; Patil and Patil, 1979 and Chaudhary, 1985). However, Daji (1943), reported still higher ash content value (8.9%) in niger seed variety.

The crude fibre content in the present study was found much lower than

the previous findings. Several other workers have also reported crude fibre content between 9.35 to 20% (Ramakrishna *et al.*, 1973; Sharma and Mishra, 1978 and Patil and Patil, 1979). The difference in the values of crude fibre content obtained in the present investigation might be due to the variation in the methodology employed.

Previous findings on fat content of niger seeds are very scanty. Chavan (1961), reported only 25.2% fat content in niger seeds whereas, in the present investigation it was 36.12%.

The calculated value of Carbohydrate was obtained by difference. Very less informations are available on the Carbohydrate of niger seed. The value (10-18%) are recorded in this study was found almost similar to the value reported previously by Gopalan *et al.*, (1978) and Patil and Patil (1979).

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