TITLE: THE PRODUCTION OF PROTEIN NUTRIENT FROM *PARKIA BIGLOBOSA* SEED

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SUMMARY OF INVENTION

This invention relates the optimum conditions and procedures for the development of the maximum yield of protein from fermented seeds of *Parkia biglobosa*. The steps involved include: (a) Separation of the seeds from the pod (b) The separation of the nuts the seed pericarp (c) The softening of the nuts (d) The enzymatic fermentation of the softened nuts.

We have successfully produced about 52% protein nutrient, for the first time, from nuts of *Parkia biglobosa* at the optimum conditions of about 72 hours fermentation period, *Bacillus subtilis* enzymes concentration of about 20ml/gm seed and at a temperature of about 40ºC.

With the help of MINITAB 17 software, our experimental data has produced a generalised regression equation:

$$\% \text{ protein} = 36.5 + 0.386\ X_1 + 1.476\ X_2 - 0.501\ X_3 - 0.0013\ X_1X_2 - 0.00163\ X_1X_3 + 0.00194 X_2X_3 - 0.00204\ X_1X_1 - 0.0287\ X_2X_2 + 0.00274\ X_3X_3$$

Where the three variables are defined thus: X_1 as fermentation duration, X_2 as Microorganism concentration (ml/g) and X_3 as Temperature (ºC).

DESCRIPTION OF INVENTION

(a) Technical Field: This invention is in the field of Biochemical Reaction Engineering and Biotechnology.

(b) Background of Invention: *Parkia biglobosa* is a tropical tree known as Locust Bean tree. In Africa many species of trees serve as sources of food and for medicinal purposes to indigenous people. Some of these trees provide ecological services including microclimate amelioration and soil fertility. They serves as source of income for many poor people in the rural areas; some of these trees are *Parkia biglobosa* (African locust bean tree) (Igba in Yoruba land) and *Vitellaria paradox* (shea butter tree). Farmers manage and protect these trees for their nuts and fruits. Despite their important uses, the populations of these trees are reducing and they remain semi - or undomesticated [1-3].

African locust bean tree was named *Parkia biglobosa* by Robert Brown, a Scottish botanist in 1826 after Mongo Park, a Scottish surgeon who explored West Africa in 1790's. Mongo gave this tree a local name 'nitta' [4-7]. In 1995, research indicated that there were about 77 more species. African locust been tree was described by Robert Brown, as a genus of flowering plants in the legume family, Fabaceae, which belongs to the sub-family *Mimosoideae* and *Leguminosae* with the genus *Parkia* and botanical name *Parkia biglobosa* [8].

The introduction of this food condiment into African diet fills a gap in the protein source of African food. The improvement of the protein level of fermented seed to about 52 % through this invention is a very significant contribution to non-animal protein food source.

Laboratory preparation of *Parkia biglobosa*: The *Parkia biglobosa* purchased from the market were processed using method of [4, 5, 9, 10] .

Preparation of *Bacillus subtilis*: Preparation of the inoculum used was carried out using method of [11-13].

What we claim:

(1) The conditions and process of developing maximum yield of protein nutrient from the seed of *Parkia biglobosa* consisting of steps: (a) Separation of the seed from the cotyledon, (b) cooking of seed, (c) Pulverisation of seed, (d) Fermentation of seed.

(2) As in claim (1) wherein separation of the seed from the cotyledon is a process whereby the harvested pod of *Parkia biglobosa* is sliced open and the yellow fruit containing the cotyledon is obtained, soaked in water and masticated to obtain the cotyledon.

(3) As in claim (2) of the separation step, the washed cotyledon obtained from the separation above, is boiled in water for a period of about twelve hours to soften the hard cover of the cotyledon.

(4) As in claim (3), the softened hard cover of the cotyledon obtained above is subjected to abrasive force to rip open the cotyledon cover and the separated from the nuts through water floatation.

(5) As in claim (1) wherein cooking of the seed is a process whereby separated nuts in claim (4) above is thoroughly washed free of the back cotyledon cover, and then boiled in water.

(6) As in claim (1) wherein fermentation is a process whereby the pulverised seed in claim (5) is homogenously mixed with *Bacillus subtillis* as an inoculum.

(7) As in claim (6) of the fermentation step, the mixture of pulverised seed and *Bacillus subtillis* obtained above is placed in a Bio-reactor operating at a constant temperature of 40 ºC and left to ferment for about 72 hours.

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