

## ***Datura metel* L.: Analgesic or Hallucinogen? “Sharo” Perspective**

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**Abstract:** Human civilization has come a long way since the creation of man in the Garden of Eden. Much of the progress recorded has been due to man’s quest for happiness. However happiness in itself is relative and varies between individuals, groups and even races. Despite these variations, pains (whether physical or emotional) remain one variable that all of mankind seeks to live without. It is little wonder then that the childhood memories which inspired this study are anchored on the quest or search for happiness and also the deliberate and conscious effort to avoid pain. “Sharo”, a festival that defines the attainment of manhood, has embedded in it, the quest of any Fullo adolescent for a bride. A bride that has all the attributes (beautiful, fertile and healthy) for procreation. Fulani culture requires that all males must prove their manhood by passing the test of sharo as a condition for procreation. The continuity of a race or an individual that procreation guarantees is what brings happiness. However the beatings that one receives during sharo inflict lots of pains due to severe injuries. To ameliorate the severe pain and the adrenaline surge to fear, pre-mature urination and defecation etc, the Fulani have for centuries used *Datura metel* (Zakami) as a cure all remedy. My fascination with Zakami since 1982 was not because I wanted to participate in the festival of sharo but to investigate the origin of the bizarre effect it had on my secondary school colleague who was inspired to swallow Zakami seeds after we watched the festival of sharo. Thereafter, he began to show signs of hallucination and restlessness, suddenly he slumped and fell asleep; this one symptom has never been reported nor documented by the traditional Fulani and the youths that abused the plant. He had a deep and long sleep and when we could not wake him up, we feared he will die. I have never forgotten that event and each time i watch an animal sleep due to anaesthesia. I am reminded how my friend anaesthetised himself by taking seeds of Zakami. This study is about the childhood memories and quest to understand why the seed of *Datura* can produces different effect in different persons.

**Key words:** *Datura metel* • Analgesic • Hallucinogen • Sharo • Zakami • Nigeria.

### **INTRODUCTION**

**The Plant:** *Datura metel* L. family solanaceae common name thorn apple; indigenous names: Hausa-Zakami; Yoruba-Apikan; Igbo-Myaramuo [1]. In Nigeria, especially in the northern part, *Datura* is found growing as a weed in abandoned farmlands and or dumpsites. The leaves and seeds of the plant are used for several purposes and in several ways especially for its psychoactive activities, thus making the plant parts to be abused by the youths who are more prone to dangers of smoking and drug abuse [2].

**Plant Morphology:** It is an annual shrub, grows erect with branches and glabrous herb sharing the sympodial

growth of solanaceae attaining the height of 60-100 cm (4-5 feet) [3]. The leaves are simple, alternate, estipulate and triangular to ovate and measure about 18cm×13cm in length. Lamina is dentate, pointed petiole and asymmetric base [4]. Inflorescence occurs as acyne with erect nearly white flowers. Both the calyx and corolla are tubular and trumpet shaped about 26cm long [2]. Fruits are capsules, round (1.25 inches in diameter), dehiscent and covered with blunt prickles or warts, usually pale green [1, 5].

**Geographical Distribution of Plant:** The plant *Datura metel* L. originated from India, it has been naturalized and become cosmopolitan in Tropical Africa. In Nigeria it often occurs as a weed but it is sometimes cultivated [1].

**Medicinal Uses Of The Plant:** The plant is of high medicinal value because of its variety of phytochemical constituents [6]. The leaves and seeds are widely used in phytomedicine as hallucinogen [2], antispasmodic, ant-tussive and bronchodilator [4, 7]. The plant has been used in the treatment of gonorrhoea, menstrual pain, mental illness or insanity and insomnia. All parts of the plant have strong intoxicant, narcotic and sedative, aphrodisiac, astringent and antispasmodic activity [1]. The plant also finds application in the treatment of catarrh, diarrhoea, skin disease, epilepsy, hysteria, rheumatic pain, haemorrhoids as well as in the treatment of laryngitis and trachitis [4, 7, 8]. *Datura metel* seed reduced blood glucose in diabetic rats, the spiny fruits have been used to chard cotton and calyx base is rubbed into tooth cavity to alleviate tooth ache. [2, 3, 9]. A drink made from the seeds is given as intoxicant to Fulani youths (Nigeria) to incite them into “Sharo contest” an ordeal of manhood while others drink it to carry out rigorous farm work, they claimed it alleviate pain and make them work tirelessly [3].

**The Fulani (People):** The Fulani (people) call themselves Fulbe (Fullo, in singular). They were originally nomadic herders, traders and farming people living throughout West Africa. Today a sizeable number of Fulani live in urban centres [10]. While their origins are disputed, Arab writers recorded their existence over 1000 years ago [10]. However experts believe that they originated from a region that occupied the present day northern Senegal [11, 12]. Over the centuries, they migrated with their cattle to occupy vast areas in the Sahel and Savannah regions of West Africa and evolved into many subgroups with a variety of designations including Fulbe, Jelgove, Gurma, Gorgave, Fellata, Fula, Fulakunda, Bororos, Wodaabe, Peul, Pulaar, Halpulaar, Liptaako and Toucouleur (Tukolor) [11, 12]. Presently, they live in communities throughout much of the West-Africa from Senegal to Cameroon and as far east as Sudan and Ethiopia. The Fulani migratory range covers an area larger than continental United States and Western Europe [10, 11, 12].

**History Of The Fulani:** Origins; Some believe that they are from a Semitic origin [10]. According to the tradition, the ancestor of Fulani is Jacob son of Israel, son of Isaac, son of Abraham when Jacob left Canaan and went to Egypt where Joseph was established [10, 11, 12]. The Israelites prospered and grew in population while living in Egypt. Fulani people descended from them (Israelites). After a long time a new Pharaoh who did not know about Joseph's fame in Egypt came to power. He made the

Israelites work hard as slave labourers. The Pharaoh oppressed the people, including Fulani's who were rich in cattle [10, 11, 12]. They emigrated from Egypt, some of them went back to Palestine and Syria under Moses guidance and the other crossed the Nile with their cattle and headed west. They took the name of *fouth or foudh* meaning *those who left*. A group from the latter moved along the edges of the Sahara to Touat-Air and then to West Africa [10, 11, 12].

Those who came to Masina (in present day Mali) spread to the neighbouring regions where they were rejoined by Fulani groups from Morocco [12]. It was established that at about 700AD, Fulani groups from Morocco, moved southward and invaded the regions of Tagout, Adrar, Mauritania and Fuuta Tooro [10, 12]. The cradle of the Fulani group is situated in the Senegal River valley, where Fulani established kingdoms until the beginning of the 9<sup>th</sup> Century. Around that period they continued their migration in the regions of *Bundu, Bambouk, Diomboko, Kaarta and Bagana* [10, 12]. Finally those who were concentrated in the *Ferlo* from the 11<sup>th</sup> to the 14<sup>th</sup> century moved in various groups to the Fuuta Jalon, to the Volta river basin, to the Gurma, to the Hausa land, to the Adamawa, Boghirme and Ouadai [10, 12].

**“Sharo”:** The institution is of vital importance to the nomadic Fulani and all kinds of customs and ceremonies have arisen around it [10]. One such ceremony is the Sharo, a public flogging that is a test of manhood. It is said that this ordeal had to be successfully passed by every youth of the tribe before he be considered a man and eligible to marry [10]. A girl already engaged to a youth who shirked or failed in this Spartan test would consider such cowardice as sufficient for breaking off the engagement [10, 13]. Today a youth who does not submit to the Sharo ordeal can usually obtain a wife but loses prestige [10, 13, 14].

The preparation of youths to undergo the sharo ordeal follows four main steps; first abstention from sexual intercourse, second; fasting, third; avoidance of sour milk and four; the drinking of “medicine” credited with possessing magical protective qualities, concoction of the “hairy thorn apple” (*Datura metel*) taken when in the course of preparing for the ordeal [10, 13, 14].

During the Sharo ceremony, the marriageable girls and young men form an inner ring round the space chosen for the sharo. The rest of the spectators form the outer ring. The young men attract attention by shaking thin sticks about a foot long with some thirty pieces of calabash, each about the size of a florin, threaded upon it.

They hold out the sticks horizontally in front of them with both hands and rattle it to and fro [10, 13]. In the centre, the youth who is to undergo the ordeal stands stripped except for the leather kilt, ornamented with cowries proper to the occasion and prepares to receive a lash from some unknown quarter [14]. The tester, an age mate belonging to a different family, circles round the challenger armed with a strong thin stick smoke-toughened [10]. After preliminary feints the challenger is dealt a resounding blow on his chest and is repeated with intervals to allow for recovery three times. Each stroke leaves angry red weals and may draw blood [10, 13].

It is the aim of the youth to remain under the fixed gaze of the men and girls of his side without flinching, for if he winces he will bring down upon himself the contempt of the girls and shame on his kindred [10]. If he successfully passed the ordeal, he returns another time for his revenge. The position of challenger and tester being reverse on the next occasion [10].

#### ***Datura metel*:**

**Analgesic or Hallucinogen?:** Wannang *et al.* Evaluated the analgesic properties of *Datura metel* seeds aqueous extract in Wistar rats as follows. The analgesic activity was determined by measuring drug-induced changes in the sensitivity of the pre-screened rats to heat stress, using a hot plate at temperatures of 50-58°C, applied to their tails. The distance between the heat source (hot plate) and the tail skin was 1.5 cm and the cut-off reaction time was fixed at 10sec. to avoid tissue damage. The time taken for rats to react to the external stimuli introduced was measured and a mean reaction time was obtained for each group that was set up for the experiment. Pentazocin (1 mg/kg) was used as the standard analgesic for comparing the tail-flick latencies of crude extracts. Tail-flick latency after 60 min of the drug (extract) administration was considered to be optimum. Hot water-induced method was also used at similar temperatures with the hot-plate method in order to resolve for any differences, especially that there was no analgesiometer at the time this experiment was carried out. The aqueous extract (100, 200 and 300 mg/kg) showed no significant analgesic activity in both radiant heat tail flick model and the acetic acid induced writhing model.

The abdominal constriction response induced by acetic acid is a sensitive procedure to establish peripherally acting analgesics. The response is thought to involve local peritoneal cells and mediated by the prostaglandin pathways. In the tail-flick method, increase in stress tolerance capacity of the animals indicates the possible involvement of a higher centre, thus, it is

thought to involve central activity. In general, there was a perception of pain by the rats administered with the extract in the two test models used, after 60 min and above of pre-treatment with the seed extract of *D. metel*. Hence, the analgesic activity of *D. metel* seed extract was found not to be significant on acetic acid induced model, as well as the radiant heat tail-flick model ( $P>0.05$ ) In conclusion, it may also be said from the study that traditional uses of aqueous extract of *D. metel* seed for the treatment of various types of pain conditions has got no definite basis, as revealed from the experimental results.

Babalola *et al.* Evaluated the effect of the crude methanolic seed extract of *Datura metel* on the behavioural sleep pattern of Wistar rats and its potential as an oral anaesthetic in dogs.

The extract at the dose rate of 7, 9, 11, 15, 20 and 25 g/kg administered to six rats respectively showed various effects on the rats as recorded in Table 1.

The observed effect of the extract on the behavioural sleep of the Wistar rats implanted with electrodes in the hyperstriatum (HS), optic tectum (OT) and reticular formation (RF) and the electromyogram from the muscle around the occipital region (EMG) and administered the extract orally at a dose rate of 25 g/kg. The EEG patterns observed from the treated Wistar rats showed synchronisation of the waves from HS, OT and RF. With reduction of the EMG.

In the normal calm alert state EEG featured wave form of varying voltages and frequency characterised by desynchronisation.

While in the dogs administered *Datura metel* at dose rate of 1.2, 1.5 and 2 g/kg produced excitement followed by mild sedation in four dogs. At the dose rate of 2.4 g/kg the dogs reaction was characterised by restlessness and excitement that lasted for 30 minutes, followed immediately by sedation that progressed to induction of anaesthesia. Analgesia in the dogs was evaluated using rat tooth haemostatic forcep clamp at first ratchet lock at the interdigital space and the dogs responded to pain.

The extract was subjected to phytochemical screening and the following secondary metabolites were detected: alkaloids, flavonoids, reducing sugars, tannins, terpenoids, resins and steroid glycosides which were also reported [1-3, 15-17]. The presence of the alkaloids in the seed extract could be responsible for the pharmacological effect observed in both rats and dogs. Tyler *et al.* reported that scopolamine (an alkaloid) content of the plant *Datura metel* L. is often associated with the CNS depression effects of the plant. Hyoscyamine, one of the alkaloids content of the plant described by [18], it acts by blocking all the body secretions, resulting in dryness of

Table 1: Effects of different dose rate of *Datura metel* L. seed extract in Wistar rats

Dose rates (g/kg)	Signs observed.
7 and 9	-Excitement and restlessness. -Indifferent to immediate environment. -Crunching at the corners of the cage (30 minutes).
11 and 15	- Excitement (40 minutes) - Induction of behavioural sleep (60 minutes)
20	- Excitement (30 minutes). - Induction of behavioural sleep (65 – 70 minutes).
25®	-Excitement (5 minutes) -Induction of behavioural sleep suddenly after 7 minutes, lasting for about 80 minutes

the mouth, throat also blocks the lachrymal glands responsible for tearing, including the sweat glands which are responsible for the body thermal regulation [19]. Despite the poor analgesic property of the plant extract, the reason why the Fulani take the seed of this plant during “Sharo” could be attributed to the effect of hyoscyamine, if taken in substantial quantities is capable of blocking all secretions including tearing [19]. Personal communications with some of the youths and Fulani that takes the seeds revealed that, what they feel shortly after taken the seeds are dryness of the mouth and throat, then followed by delirium. The delirium state is one of the important effects of the seed that gives them (Fulani) the confidence to go through “Sharo”. The issue of whether they feel pain or not during sharo is personal.

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