

## BLOCKCHAIN BASED MILK DELIVERY PLATFORM FOR STALLHOLDER DAIRY FARMERS IN KENYA: ENFORCING TRANSPARENCY AND FAIR PAYMENT

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### ABSTRACT:

All CE separations were conducted on a Beckman P/ACE system 2200 HPCE instrument (Beckman, Palo Alto, CA, USA) coupled with a AST Bravo LC 4/66d PC with system control and data captured by System Gold software (Beckman Instruments). The electrophoretic separation was performed on a fused silica capillary of 47.6 cm (39.6 cm effective length) and 50  $\mu$ m i.d. (Polymicro Technologies, Phoenix, Arizona, USA) with thermostatic cartridges at 25.0°C for all measurements. Capillaries were conditioned daily by rinsing with 1 M sodium hydroxide for 5 min, with ultra-pure water (Milli-Q, Millipore) for the next 5 min and finally with running buffer for an additional 5 min. After each run, the capillary was washed with 0.1 M sodium hydroxide, then with water for 2 min, and finally rinsed with running buffer for 2 min. A constant voltage of 25 kV with a linear voltage ramp-up set at 0.17 min was used in the experiments. UV absorption was measured at a wavelength of 214 nm. Sample injections were performed in the voltage injection mode at 10 kV for 10 s. Acetone was used as the electroosmotic flow (EOF) marker

### INTRODUCTION

Aconites are the dried rootstocks of Aconitum plants. Two species of aconites, namely, *A. carmichaeli* Dexb. and *A. kusnezoffii* Reichb., are officially listed in the Chinese Pharmacopoeia (Committee of Chinese Pharmacopoeia, 2005). Aconites have been used in numerous countries throughout the world to alleviate pain, rheumatism and neurological symptoms (Ameri, 1998a; Liou et al., 2005). Traditionally, crude aconite roots must be properly processed by prolonged heating, soaking or steaming/boiling in water to reduce

their toxicity before oral administration. Phytochemical studies indicated that the major components in crude aconite roots are diester-diterpene alkaloids such as aconitine (1), mesaconitine (2) and hypaconitine (3). During processing, the diester-diterpene alkaloids in aconite roots are subjected to degradation, forming monoester-diterpene derivatives, namely benzoyleaconine (4), benzoylmesaconine (5) and benzoylhypaconine (6) (Fig. 1) (Hikino et al., 1977; Li et al., 2001). The diester-diterpene alkaloids 1, 2 and 3 showed both therapeutic and toxic

effects; however, their monoester-diterpene derivatives 4, 5 and 6 exhibited medicinal properties with low toxicities (Hikino et al., 1977, 1980; Oyama et al., 1994, Ameri, 1998b; Bello-Ramirez et al., 2003; Bello-Ramirez and Nava-Ocampo,

#### **LITERATURE SURVEY:**

##### **The effects of Aconitum alkaloids on the central nervous system**

Preparations of Aconitum roots are employed in Chinese and Japanese medicine for analgesic, antirheumatic and neurological indications. The recent surge in use of phytomedicine derived from traditional Chinese medicine as well as increasing concerns about possible toxic effects of these compounds have inspired a great deal of research into the mechanisms by which certain Aconitum alkaloids may act on the central nervous system. The pharmacological effects of preparations of Aconitum roots are attributed to several diterpenoid alkaloids. The main alkaloid of these plants is aconitine, a highly toxic diterpenoid alkaloid which is known to suppress the inactivation of voltage-dependent Na<sup>+</sup> channels by binding to neurotoxin binding site 2 of the alpha-subunit of the channel protein. In this article the pharmacology of several structurally related Aconitum alkaloids is highlighted and their therapeutic vs toxic potential is discussed. Neurochemical and neurophysiological studies will be reviewed with emphasis on the effects of the alkaloids in regions of the brain that have been implicated in pain transmission and generation of epileptic activity.

##### **Structure-dependent inhibitory action of the Aconitum alkaloids 14-benzoyltalitasamine and talitasamine in rat hippo- campal slices. Naunyn Schmiedebergs Arch Pharmacol**

**AUTHOR: Ameri A**

In the present study the effects of the two Aconitum alkaloids 14-benzoyltalitasamine and talitasamine on neuronal activity were investigated in order to obtain further insight into structure-dependent effects of this group of alkaloids on central nervous activity. Both alkaloids are closely related to aconitine, the main alkaloid of plants of Aconitum species. However, they have shortened side chains at position C3 and C8 of the molecule.

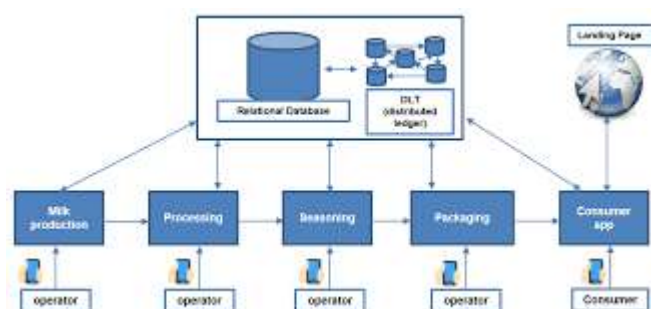
#### **EXISTING SYSTEM :**

The stock solutions of 1, 2 and 3 (5 mg/mL in acetonitrile) were used for preparing stress samples. Each stress sample was prepared under the guidelines of International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) with modifications (Expert Working Group of ICH, 2003). The stress conditions were set as follows: (a) alkaloid solutions in 0.5 M hydrochloric acid were exposed at 80°C for 20 h for acidic hydrolysis; (b) alkaloid solutions in 0.1 M sodium hydroxide were exposed at 80°C for 1 h for basic hydro- lysis; and (c) an oxidative stress condition was prepared by exposing the solutions to 3% hydrogen peroxide at room temperature (25°C) for 8 h. An aliquot (20 µL) of each stock solution was transferred to a 500 µL Eppendorf tube and mixed with an equal volume of 1 M

hydrochloric acid, 0.2 M sodium hydroxide or 6% hydrogen peroxide in order to form the stress sample solutions. The stress samples were then evaporated to dryness under a stream of nitrogen at 40°C and the residues were dissolved in 50 µL of acetonitrile. After centrifugation, the supernatants were transferred to micro-vials for CE analysis.

### PROPOSED SYSTEM :

The effect of the pH of the running buffer on electrophoretic mobility is shown in Fig. 2A and indicates an optimum pH of 7.8. The electrophoretic mobilities of the analytes decreased as the concentration of Tris increased from 100 to 300 mM (Fig. 2B). The optimised concentration of Tris was at 200 mM. The effect of perchloric acid on the electrophoretic mobilities is depicted in Fig. 2C. It was found that perchloric acid significantly changed the resolution of the aconite alkaloids in comparison with those obtained following the addition hydrochloric acid, phosphoric acid or TFA. The effect of 1,4-dioxane on the separation of the aconite alkaloids was studied and the results are shown in Fig. 2D. The electrophoretic mobilities of the alkaloids decreased as the concentration of 1, 4-dioxane increased from 0 to 50%. The optimum result was observed at a content of 40% of 1, 4-dioxane



### Blockchain based Milk Delivery Platform for Stallholder Dairy Farmers in Kenya: Enforcing Transparency and Fair Payment

In propose paper author is describing about milk production of Kenya country from its farmer. All farmers will sold their milk to 3<sup>rd</sup> part brokers or NADAF staff members and they will record each farmer milk delivery in a manual inventory report or in computer excel or centralized server. All framers may be no or less educated so brokers may alter farmer milk deliver records and make less payment to farmers and steal money.

To overcome from above issue author of this paper suggesting to migrate such inventory to Blockchain based server where data storage is immutable which means data cannot be alter in any manner after storage. Blockchain is a decentralized network which store data in multiple nodes and if one node is down then it can retrieve data from other working nodes. Blockchain store each record as block or transaction and associate each block with hash code and before storing any new block then it will verify hash code of each old blocks and if all records verified successfully then only it will store new records. So data alteration is impossible in Blockchain.

So by using Blockchain we can save farmers money stealing by brokers.

To implement this project we have designed following modules

- 1) Admin: admin can login to application by using username as admin and password as admin and then can add new farmer details who supply milk and add new NADAFA staff members. Admin can view all staff and farmer details
- 2) NADAFA Staff Login: staff can login to application by using username and password given by admin and then record all milk deliveries done by farmer and all this delivery details will be saved in Blockchain

To store record in Blockchain we need to design SOLIDITY Smart Contract code and this code contains all functions to store farmer and staff details and then this contract will be deployed on Blockchain Ethereum tool. After deployment we can call this contract to read and store data by using PYTHON WEB3 package.

Below screen showing solidity code



In above screen we have designed two functions where one is used to store staff details and other function is used to store and retrieve milk delivery details. Now to deploy this contract in Blockchain just go inside 'hello-eth/node\_modules/.bin' folder and then

double click on 'runBlockchain.bat' file to get below screen



In above screen Blockchain generate some default accounts and keys and now in same console type "truffle migrate" and press enter key to deploy contract to Blockchain and get below output



In above screen in white colour text we can see MILK contract deployed and we have to specify that contract address in python code to access this Blockchain function and below is the python code



In above screen python DJANGO server started and now open browser and enter URL as <http://127.0.0.1:8000/index.html> and press enter key to get below screen



In above screen click on 'Admin Login' link to get below login screen



In above screen admin is login and after login will get below screen



In above screen 'admin' can click on 'Add New NADFA staff' link to add staff details and get below output



In above screen admin is entering staff details and then press 'Add Staff' button to get below output



In above screen staff details added in Blockchain and now click on 'Add New Farmer' link to add farmer details



In above screen admin adding Farmer details and then press button to get below output



In above screen farmer details added and now click on 'View Staff' link to view all staff details saved in Blockchain



In above screen admin can view all staff details and similarly you can click on 'View Farmers' link to view all registered farmers



In above screen admin can view all farmer details and now logout and login as 'Staff Members'



In above screen staff member is login and after login will get below output



In above screen staff member can click on 'Add Farmer Milk Delivery' link to add farmer milk delivery details



In above screen staff member will select farmer name from drop down box and collect milk from farmer



In above screen staff member selected farmer name and enter milk price and quantity and then press button to store milk delivery details in Blockchain and get below output

## CONCLUSION

We developed a blockchain-based milk delivery system for rural farmers in order to encourage transparency and equity in the payment of dairy producers. The technology uses blockchain to enable the creation of documents that are unchangeable and unrepudiable by any parties, including farmers and nearby milk collection facilities. Farmers can use these records as collateral for financial assistance in order to forecast the future of their dairy operation and show that it is viable. The platform is managed and new blocks can be added to the network. In the future, different dairy knowledge can be added and a large number of fields can be used for farmers and workers. Different IDs can be given to sticks and farmers to sign in. Verification can be added to sign in. Purchasing products online can also be done. Unified Registration System: Single advanced stage expels the bureaucratic silos and makes a difference in driving more prominent proficiency and lessening inaccuracies/forgeries.

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