Introduction

Soup is a tasty, popular food that is nutritious, wholesome and stimulates the human appetite. Soup thickening usually improves its taste, but most significant is the nutritional value of foods been thickened. In fact, every time the soup is thickened its nutritive value is determined by the ingredients of the thickener added to it [1]. Generally, condiments which when added to an aqueous mixture increases its viscosity without substantially modifying its other properties, such as taste, aroma and drawability are termed soup thickeners or thickening agents. Thickeners provide the soup body, increase its stability and improve suspension of added ingredients. Thickening can improve the nutrition and beneficial properties of foods such as brown bread or soups, and help to prevent choking or aspiration in people with medical issues involving chewing or swallowing [1].

Agbono (Irvingia gabonensis) is a native forest tree fitting to the group of plants classified as "non-timber forest products" (NTFPs). Irvingia gabonensis is a sweet soup condiment with a creamy consistency and nutty taste. It is known for its nutritional benefits and can be eaten fresh with its kernels collected from wild forest (60%) and from the family gardens (10%) and fields (30%). The kernel of Irvingia gabonensis contain 54-67% of fatty matter and serves as condiment used in thickening and flavouring soup[5]. The more Irvingia gabonensis in soup, the more acceptable it becomes [6-8].

This work is hence intended to investigate the drawability and runcidity of agbono soup identifying the various proximates and the phytochemicals contained in agbono cotyledon.

Materials and Methods

Preparation of the Agbono Cotyledon: The agbono (Irvingia gabonensis) cotyledon was bought from Iwofe daily market (4
cups) taken to the Chemistry Department laboratory, Ignatius Aju-
ru University of Education, Rumuolumeni, Port Harcourt, properly
cleaned using kitchen knife, and afterwards ground to powder using
mortar and pestle. Three fractionating columns were adopted
to extract the wax of agbono (Irvingia gabonensis) cotyledon using
ethanol, petroleum ether and distilled water as solvents.

**Petroleum Ether Extract:** A 100g of the ground agbono (Ir-
vingia gabonensis) cotyledon was weighed and gradually trans-
ferred into a soxhlet extractor using spatula. The cotyledon was
submerged with petroleum ether (60-80%, 400mL). The soxhlet
extractor set up with its mixture content was heated using heating
mantle to enhance full extraction of the agbono wax.

**Ethanol Extract:** To 450mL ethanol solution in a soxhlet ex-
tractor, 100g of the ground Irvingia gabonensis was transferred
gradually with the aid of a spatula and the wax were fully extracted
on a heating mantle.

**Distilled Water Extract:** The same processes as explained
above were adopted with slight modifications.Distilled water
(300mL) was used as the extraction solvent [9,10].

**Methods of Analysis**

After all extraction processes, the three extracts were analyzed
for proximate and phytochemical compositions at the Plant Anat-
omy and Physiology Research Laboratory, University of Port-Har-
court. The cotyledon was analyzed proximate contents using the
Furnace method (for ash content); air oven method (for mois-
ture content); Cleg anthrone method (for carbohydrate content);
Kjeldahl method (for protein content); Phase separation method
(for lipids content), while the phytochemical composition was de-
termined through qualitative analysis [11-13].

**Results and Discussions**

Table 1 revealed that Irvingia gabonensis contains the follow-
ing proximate contents; carbohydrate, protein, lipids, moisture and
ash at different quantities of 0.17%, 0.80.41%, 0.19.14%, 0.15% and
0.13% respectively for the petroleum ether extract. The proximate
contents can be represented as lipids > moisture > carbohydrate >
ash > protein. Also, the proximate contents for the ethanol extract
displayed values of 04.31%, 15.17%, 0.25%, 0.14% and 0.13% for
moisture, lipids, carbohydrate, ash and protein respectively. It can
also be represented as; Moisture > lipids > protein > carbohydrate >
ash > protein. The distilled water extract presented the content of the
moisture, lipids, protein, carbohydrate and ash as 94.41%, 4.91%,
0.35%, 0.25% and 0.08% which can be represented in the order
moisture > lipids > protein > carbohydrate > ash. Generally, the
phytochemical contents were lesser in content compared to other
proximate contents. On the other hand, the protein content for the
petroleum ether extract equaled that of ethanol extract, while the
content obtained from the distilled water extract was greater than
that of extracts [13-15].

![Table 1: Proximate Analysis of Agbono Cotyledon.](attachment:image)

![Table 2: Phytochemical Analysis of Agbono Cotyledon.](attachment:image)
| Saponins | Steroids | Oxalate |
|---------|----------|---------|
| +       | +        | -       |

Note: (+) = Present; (++) = Highly Present, (-) Absent

The obtained data revealed that tannins was present (+) in petroleum ether extract, highly present (++) in ethanol extract, and averagely present (+) in the distilled water extract. However, that of alkaloids was extremely present (++) in petroleum ether extract, normally present (+) in ethanol extract, and averagely present (+) in distilled water extract. Likewise, the result showed that flavonoid was just present (+) in petroleum ether extract, present (+) in ethanol extract and highly present (++) in distilled water extract; glycosides was observed present (+) in the petroleum ether extract, normally present (+) in ethanol extract and completely absent (-) in the distilled water extract. The phytate and oxalate were also completely absent (-) in the three (petroleum ether, ethanol and absent distilled water) extracts. However, saponins were noticed averagely present (+) in all the (petroleum ether, ethanol and absent distilled water) extracts, while steroids were absent (-) in petroleum ether extract, present (-) in ethanol extract and averagely present (+) in distilled water extract.

Summarily, this work has established that various proximates make up the agbono cotyledon (Irvingia gabonensis). The work also showed that phytochemicals constitute the compositions of Irvingia gabonensis. The obtained results has it that Irvingia gabonensis contains bioactive secondary metabolites (tannins and alkaloids) such as; flavonoids, saponins, glycosides, steroids, phytate and oxalate; that both the proximate and phytochemical contributes to its drawability, aroma, taste and colour; and rancidity when used to prepare soup; the moisture and ash (water) contents were solely responsible for its drawability; the lipids (fat and oil) contents gives rise to its colour; the protein content backs majorly its taste; and the carbohydrate contents were responsible to its aroma. This work recommends that agbono should be consumed by everybody especially people that are fat, people that are suffering from diabetes and people that have excess cholesterol in their body [16-18].

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