Papaya sap

Introduction Rubber is an elastic hydrocarbon polymer which occurs as a milky emulsion (known as latex) in the sap of a number of plants but can also be produced synthetically. The major commercial source of the latex used to create rubber is the Para rubber tree, Hevea brasiliensis (Euphorbiaceae). This is largely because it responds to wounding by producing more latex. Other plants containing latex include figs, euphorbias and the common dandelion.

These have not been a major source of rubber, though when Germany was cut off from supplies of rubber during World War II, attempts were made to use such sources, before being supplanted by the development of synthetic rubber. It is believed to have been named by Joseph Priestley, who discovered in 1770 that dried latex rubbed out pencil marks. In its native Central America and South America, rubber has been collected for a long time. The Mesoamerican civilizations used rubber mostly from Castilla elastica.

The Ancient Mesoamericans had a ball game using rubber balls (see: Mesoamerican ballgame), and a few Pre-Columbian rubber balls have been found (always in sites that were flooded under fresh water), the earliest dating to about 1600 BC. According to Bernal Diaz del Castillo, the Spanish Conquistadores were so astounded by the vigorous bouncing of the rubber balls of the Aztecs that they wondered if the balls were enchanted by evil spirits. The Maya also made a type of temporary rubber shoe by dipping their feet into a latex mixture.

Rubber was used in various other contexts, such as strips to hold stone and metal tools to wooden handles, and padding for the tool handles. While the

ancient Mesoamericans did not have vulcanization, they developed organic methods of processing the rubber with similar results, mixing the raw latex with various saps and juices of other vines, particularly Ipomoea alba, a species of Morning glory. In Brazil the natives understood the use of rubber to make water-resistant cloth.

A story says that the first European to return to Portugal from Brazil with samples of such water-repellent rubberized cloth so shocked people that he was brought to court on the charge of witchcraft. When samples of rubber first arrived in England, it was observed that a piece of the material was extremely good for rubbing out pencil marks on paper. This was the origin of the material's English name of 'rubber'. Blocks of the material are still used for this purpose, and known as 'rubbers' in England, causing occasional amusement to Americans, to whom a 'rubber' is a condom.

The sap is any liquid found in the stems of plants, including the liquid material that moves the younger annual rings and bark of trees and watery juices of herbaceous plants. Natural rubber is another valuable sap. The papaya’s milky sap is also called latex. Latex is a milky fluid produced by rubber trees. Latex is also used to make rubber Since papaya fruits produce latex like rubber plants, the study “ Rubber Material Source from Papaya (Carica papaya) Milky Sap” was formulated.

The study aimed to use papaya sap as main ingredient in making bioplastic because it contains starch which is one of the components in making bioplastic and also, the sap or latex is used in making rubber. Papaya is found anywhere so there is adequate supply of the main ingredient. Plus, the flow of the papaya sap is continuousand it isenvironmentfriendly because it

doesn’t harm the plant. The study is to be conducted to produce bioplastic so that the plastics that people are using in the present could somehow be replaced with the use of thisinvestigatory projectto lessen the environmental effects of the decomposition of plastics.

Objectives of the Study This investigation is anchored on the following objectives: 1) To evaluate and compare the, the appearance, texture, elasticity and strength of the rubber material. 2) To compare the experimental rubber material from the three treatments and the commercial rubber material. 3) To identify which among the three treatments made will be least fot the production of the wrapper. Statement of the Problem 1. Is there a significant difference between the experimental Rubber material and commercial Rubber material when analyzed by: 1. Appearance 1. 2 Texture 1. 3 Elasticity 1. 4 Strength 2. Is there a relationship between the cost of the experimental rubber material and commercial rubber material? 3. Is there a significant difference between the treatments’ replications when analyzed by: 1. 1 Appearance 1. 2 Texture 1. 3 Elasticity 1. 4 Strength Hypotheses of the Study Null Hypothesis 1. There is no significant difference between the experimental rubber material and commercial rubber material when analyzed by appearance, texture, elasticity, and strength. 2.

There is no significant relationship between the cost of the experimental rubber material and commercial rubber material. 3. There is no significant difference between the treatments’ replications when analyzed by appearance, texture, elasticity, and strength. Alternative Hypothesis 1. There is a significant difference between the experimental rubber material and commercial rubber material when analyzed by appearance, texture,

elasticity, and strength. 2. There is a relationship between the cost of the experimental rubber material and commercial rubber material. 3.

There is a significant difference between the treatments' replications when analyzed by appearance, texture, elasticity, and strength. Significance of the Study Rubber Manufacturers- can help in reducing the product cost of a certain material out of rubber. And also, it can help in preventing the emission of harmful gases that can cause depletion of the ozone layer and in the worsening ofglobal warming. Consumers- they can be assured that the product is safe and does not contain hazardous chemicals that can harm theirhealth. And also, it is biodegradable, so it is not difficult for them to dispose it.

Scope and Limitations of the Study Variable Limitation The independent variable of the study is the papaya sap, the dependent variable of the study is the produced rubber material and the moderator variables of the study were the processes involved in making the rubber material. Subject Limitation The study focuses on using the papaya sap as raw material in making rubber material. Time Limitation The study was conducted from August 23 to October 13, 2010. Paper works and conducting of the experiment will be done during the said p of time. Place Limitation

This study was conducted at the DOST Laboratory of the Kidapawan City National High School (KCNHS), Roxas Street, Kidapawan City. Conceptual Framework Independent Variable Dependent Variable Rubber Material Rubber Material Papaya Sap Papaya Sap Collecting of Sap Collecting of Materials Sterilization Weighing of Materials Dilution Mixing Cooking Molding Drying Collecting of Sap Collecting of Materials Sterilization Weighing of

Materials Dilution Mixing Cooking Molding Drying Moderating Variables Figure 1.

A diagram showing the interplay of the variables of the study. Locale of the Study Kidapawan City Pilot Elementary School (KCPES) Kidapawan City Pilot Elementary School (KCPES) Development Bank of the Philippines (DBP) Development Bank of the Philippines (DBP) R O X A S S T R E E T R O X A S S T R E E T City Health Office City Health Office Puericu- lture Clinic Puericu-lture Clinic Kidapawan City National High School Kidapawan City National High School City Hospital City Hospital Noodols Noodols Blue Chips Blue ChipsJollibeeJollibee To Cotabato To Cotabato

To Davao To Davao Figure2. Diagram showing the place where the study was conducted Definition of Terms Rubber- an elastic substance obtained from latex of many tropical plants, Collecting – the process of gathering all the materials needed in the experiment, especially the raw material. Cooking- the act of heating the mixture formed. Drying- the process of placing the product into the drying oven. Glycerin- an organic compound, also called glycerin or glycerin. It is a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations.

Melting- the process of liquefying the solid materials needed in the study. Mixing-the process of combining all the materials into a mixture. One of the procedures used in the study. Sterilization- the process of making the tools used in the study clean and free from bacteria. Weighing-the process of measuring the heaviness of the materials used in the study. Review of Related Literature Rubber Used in the study as dependent variable.. Rubber

any solid substance that upon vulcanization becomes elastic; the term includes natural rubber (caoutchouc) and synthetic rubber.

The term elastomer is sometimes used to designate synthetic rubber only and is sometimes extended to include caoutchouc as well. Chemistry and Properties All rubberlike materials are polymers , which are high molecular weight compounds consisting of long chains of one or more types of molecules, such as monomers. Vulcanization (or curing) produces chemical links between the loosely coiled polymeric chains; elasticity occurs because the chains can be stretched and the crosslinks cause them to spring back when thestressis released. Natural rubber is a polyterpene, i. e. it consists of isoprene molecules linked into loosely twisted chains. The monomer units along the backbone of the carbon chains are in a cis arrangement (see isomer) and it is this spatial configuration that gives rubber its highly elastic character. In gutta-percha , which is another natural polyterpene, the isoprene molecules are bonded in a trans configuration leading to a crystalline solid at room temperature. Unvulcanized rubber is soluble in a number of hydrocarbons, including benzene, toluene, gasoline, and lubricating oils. Rubber is water repellent and resistant to alkalies and weak acids.

Rubber's elasticity, toughness, impermeability, adhesiveness, and electrical resistance make it useful as an adhesive, a coating composition, a fiber, a molding compound, and an electrical insulator. In general, synthetic rubber has the following advantages over natural rubber: better aging and weathering, more resistance to oil, solvents, oxygen, ozone, and certain chemicals, and resilience over a wider temperature range. The advantages

of natural rubber are less buildup of heat from flexing and greater resistance to tearing when hot (http://www. ncyclopedia. com/topic/rubber. aspx). Starch Starch is the binding component in the study. Starch or amylum is a carbohydrate consisting of a large number of glucose units joined together by glycosidic bonds. This polysaccharide is produced by all green plants as an energy store. It is the most important carbohydrate in the human diet and is contained in such staple foods as potatoes, wheat, maize (corn), rice, and cassava.. Pure starch is a white, tasteless and odorless powder that is insoluble in cold water or alcohol.

It consists of two types of molecules: the linear and helical amylose and the branched amylopectin. Depending on the plant, starch generally contains 20 to 25% amylose and 75 to 80% amylopectin. [1] Glycogen, the glucose store of animals, is a more branched version of amylopectin. Starch is processed to produce many of the sugars in processed foods. When dissolved in warm water, it can be used as a thickening, stiffening or gluing agent, giving wheatpaste (http://en. wikipedia. org/wiki/Starch). Papaya Sap Papaya sap is the independent variable of the study.

The latex of the papaya plant and its green fruits contains two proteolytic enzymes, papain and chymopapain. The latter is most abundant but papain is twice as potent. In 1933, Ceylon (Sri Lanka) was the leading commercial source of papain but it has been surpassed by East Africa where large-scale production began in 1937. The latex is obtained by making incisions on the surface of the green fruits early in the morning and repeating every 4 or 5 days until the latex ceases to flow. The tool is of bone, glass, sharp-edged bamboo or stainless steel (knife or raxor blade).

Ordinary steel stains the latex. Tappers hold a coconut shell, clay cup, or glass, porcelain or enamel pan beneath the fruit to catch the latex, or a container like an " inverted umbrella" is clamped around the stem. The latex coagulates quickly and, for best results, is spread on fabric and oven-dried at a low temperature, then ground to powder and packed in tins. Sun-drying tends to discolor the product. One must tap 1, 500 average-size fruits to gain 1 1/2 lbs (0. 68 kg) of papain (http://www. hort. purdue. edu/newcrop/morton/papaya_ars. html#Papain).

Glycerin Glycerin is the plasticizer and the preservative to the product. Glycerin is a thick liquid that is colorless and sweet tasting. It has a high boiling point and freezes to a paste. Glycerin's most common use is in soap and other beauty products like lotions, though it is also used, in the form of nitroglycerin, to create dynamite. Glycerin is popular in beauty products because it is a humectant — it absorbs ambient water. This means that it can help seal in moisture. Not only is it used in the soap making process, it's a byproduct too.

Many soap manufacturers actually extract glycerin during the soap making process and reserve it for use in more expensive products. Even when soap manufacturers reserve glycerin for other products, however, some amount of glycerin remains in every bar of soap (http://www. wisegeek. com/what-is-glycerin. htm). Vinegar Vinegar is an acidic liquid produced from the fermentation of ethanol in a process that yields its key ingredient, acetic acid (ethanoic acid). It also may come in a diluted form. The acetic acid concentration ypically ranges from 4% to 8% by volume for table vinegar[1] and up to 18% for pickling. Natural vinegars also contain small amounts of

tartaric acid, citric acid, and other acids. Vinegar has been used since ancient times and is an important element in European, Asian, and other cuisines. The word " vinegar" derives from the Old French vin aigre, meaning " sour wine", which in turn is derived from the Latin " vinum aegrum" meaning " feeble wine" (http://en. wikipedia. org/wiki/Starch). Chapter II METHODOLOGY MaterialsTools

Papaya Sap Beaker Glycerin Graduated Cylinder Water Petri Dish Vinegar Weighing Scale Starch Paper Spatula Stirring Rod Drying Oven

Procedure: 1. Collection of Needed Materials. a. Collect the needed papaya sap and other materials to be used in the study. 2. Weighing of Needed Ingredients. a. Weighing of papaya sap. b. Weighing of starch. 3. Measuring of Needed Ingredients. a. Measuring of water, vinegar, and glycerin. 4. Mixing of Ingredients. a. Mix the sap, and water, vinegar, glycerin and starch. 5. Cooking a. Cook the mixed solution until it becomes very sticky. 6. Molding a. Pour and mold the sticky solution into the petri dish. 7. Drying a.

Place the product inside the dring oven and let it dry. 8. Surveying a. The respondents will rate the product including the commercial rubber material. Experimental Design Table 1. Mass of the raw material and the finished product. Treatment| Replication | Mass of rawmaterial in kg| | 1| 2| 3| | Treatment 1| 15g| 15g| 15g| 0. 015g| Treatment 2| 25g| 25g| 25g| 0. 025g| Treatment 3| 35g| 35g| 35g| 0. 035g| The table reflects the experimental design by treatments and replication including the mass of raw material in kilogram and the finished products in grams.

The three (3) replications per treatment exhibit the same number of replicates in grams. Table2. Mixing Treatments| Mass of the raw material for

everytreatment and replication in g| Water(mL)| Glycerin(mL)| Vinegar(mL)| Starch(g)| Treatment 1| 15| 5| 10| 5| 5| Treatment 2| 25| 5| 10| 5| 5| Treatment 3| 35| 5| 10| 5| 5| In mixing process, by treatments. It included the mass of the raw material for every treatment and replication in grams; volume of water, glycerin and vinegar; amount of starch used in the study.

The three (3) treatments exhibited different amount of mass of the raw material for every treatment and replication but contains the same volume of water glycerin vinegar and the same amount of mass of starch. The table depicts the total content of the product as indicated by treatment and replication. Statistical Tool The statistical tools that are going to be used in the study are the Simple Mean for the test of difference in the appearance and texture, and Pearson R for the test of relationship.