

For 2006). metallic nanoparticles can be synthesized through

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For the past years, metals that can resist chemical action like silver notably displayed properties of physical, chemical and biological from their large quantities. Particles of less than 100 nm in diameter drew attention for various applications in the different fields of industry. Nano-sized particles show unique properties that are considerably different from their bulk counterparts which are due to the small particle dimension, high surface area, quantum confinement and other testing. In order to exhibit such properties, the particles should be in the form of nano-size and can be scattered without the use of agglomeration. Previous studies stated that properties of silver nanoparticles such as electromagnetic, optical and catalytic are effects of shape, size and size distribution, which can be the impact of changing the synthetic methods, reducing agents and stabilizers (Abou El-Nour, Al-Warthan, Ammar, Eftaiha, 2010). Applications such catalysts, sensors, optics, antibacterial activity and data storage are influenced by the size and shape-dependent properties of metallic nanoparticles (Chaki, Chavan S.

, Chavan S., Chavan V., Sonawane, Sudrik, Vijayamohanan, 2006). Metallic nanoparticles can be synthesized through two distinct approaches. The first one is called physical approach which uses various procedures like condensation, evaporation and laser ablation. The second is called chemical approach wherein the reduction of metal ions in the solution are the result of the development of small metal clusters or aggregates (Oliveira, Ugarte, Zanchet, Zarbin, 2005). Due to the varying properties of reducing agents, chemical methods are classified into classical chemical which utilizes the common chemical reducing substances such as hydrazine, sodium

borohydride, hydrogen, etc. and the radiation-chemical that is instituted by dissolved electrons which are produced by the ionizing radiation (Shankar et al.

, 2017). The chemical method is classified into processes that uses non-toxic solvents, natural reducing agents (polysaccharides and plant extracts), biological microorganism (bacteria and fungus) and reverse micellar systems in which the aggregation process occurs in the aqueous core and the surfactant molecules encompasses the growing particles (Pileni et al., 1997). Nature has contributed approaches into the synthesis of materials having constituents of nanoscale dimensions. Biological systems serve as the “ bio-laboratory” for the synthesis of metal particles at the nanometer scale. The utilization of plants for the synthesis of silver nanoparticles gained increasing attention for its fast, environment-friendly, non-pathogenic, economical procedure and preparation of a single step technique known as the biosynthetic method. The combination of biomolecules (alkaloids, amino acids, enzymes, phenolics, polysaccharides, proteins, saponins, terpenoids, and vitamins) are used to reduce and stabilize silver ions which can be found in plant extracts. These biomolecules are environmentally harmless and are known to exhibit medicinal values, thus it has complex chemical structures (Ahmed et al.

, 2016). Several studies on siling labuyo (*Capsicum frutescens*) and its phytochemical analysis reported that they are abundant in biomolecules such as alkaloids, carotenoids, flavonoids, phenols, saponins, and tannins. The phytochemical analysis of siling labuyo (*Capsicum frutescens*) showed

favorable antioxidant activities, thus regarded as possible factors to reduce silver ions into nanoparticles (Otunola et al., 2017). The combination of seven allied alkaloids, of which capsaicin is the most present, resulted in the pungent taste of Capsicum peppers. This sharp taste is brought about by the capsaicinoid alkaloids. The phytochemicals or biomolecules are distinguished by properties such as dietetic, high biological, neurological and pharmacological activities.

Applying these in the normal diet at low levels would greatly decrease aortic entire cholesterol level, myocardial level and serum (Shankar et. al, 2017). The biological activity mainly predicts the bactericidal activity. Billion of years before the present, bacteria are amongst the known life forms that existed on Earth.

Bacteria are characterized as unicellular organisms and microscopic that lived in various environments. The relationship between bacteria and humans is complicated. For example, gut bacteria are beneficial for it may help in digestion. However, bacteria may be harmful as well for they thrive amongst living organisms. For this instance, the Staphylococcus aureus is a perfect example.

The name Staphylococcus comes from the Greek staphyle, meaning a bunch of grapes, and kokkos, meaning berry which also describes the form of this bacteria under the microscope. Staph infections may lead to a disease due to direct infection or production of toxins by the bacteria. Staphylococcus may cause boils, cellulitis, food poisoning, impetigo and toxic shock syndrome.

Anyone may acquire an infection caused by *Staphylococcus aureus*.

However, specific groups of people are at risk, like breastfeeding women, newborn infants and people with chronic conditions such as cancer, diabetes, lung disease, and vascular disease.

An increased risk of acquiring staph infections may affect injecting drug users, those with skin injuries or disorders, intravenous catheters, surgical incisions, and those with a weakened immune system due either to disease or a result of immune-suppressing medications (Stoppler, n. d.).

Another example of bad bacteria is the *Escherichia coli*. *E. coli* (*Escherichia coli*) bacteria normally thrive in the intestines of people and animals. Most *E. coli* are harmless and are actually an important part of a healthy human intestinal tract. However, some *E. coli* are pathogenic, meaning they can cause illness, either diarrhea or illness outside of the intestinal tract. The types of *E.*

*coli* that can cause diarrhea can be transmitted through contaminated water or food, or through contact with animals or persons (CDC, 2015). *Escherichia coli* is a common pathogenic bacteria that cause intestinal infection which may include abdominal pain, diarrhea, and fever. At its worst, the infection may cause dehydration, bloody diarrhea and kidney failure (Shankar et. al, 2017). A greater risk for acquiring these disease can be implicated to pregnant women, older adults, young children and those with weakened immune systems (Seladi-Schulman, 2017). Solving the problem at the nanoscale level could contribute to its remediation.