- Microbiological evaluation (Anti-bacterial activity; Antifungal activity; Anti-parasitic activity)
- Anti-diabetic evaluation (Hypoglycaemic activity)
- Anti-Fertility evaluation
- Anti-inflammatory activity
- Neuro-pharmacological activity
- Analgesic activity
- Anti-ulcer activity
- Toxicity testing (LD50, ED50) e.t.c

**ORGANOLEPTIC/ MACROSCOPICAL EVALUATION**

Organoletic and Macroscopical evaluation means the study of drugs using organs of senses. It refers to the methods of analysis where the colour, odor, size, shape, fractures of *Caryophyllus aromaticus* are observed and identified. Also special features, such as; touch and textures are considered for identification of the crude drug. In some plants, the initial sight or extract is so specific that it tends to identify itself. If this is not enough, perhaps the plant or extract has a characteristic odor or taste. Organoleptic analysis represents the simplest, yet one of the most vital forms of analysis and this is useful in determination of purity. e.g. Talca gum, which is used as a substitute for acacia gum could be identified by its colour and form. Talca gum is usually broken and also some tears are brown in colour and other colorless, whereas acacia is white to yellow in colour. The shape of the leaves of Digitalis is also a macroscopical distinguishing factor from its common adulterants.

**MICROSCOPICAL EVALUATION**

Microscopic evaluation is indispensable in the initial identification of *Caryophyllus aromaticus*, as well as in identifying small fragments of crude or powdered herbs, and in the detection of adulterants (e.g. insects, animal faeces, mold, fungi, etc.) as well as identifying the plant by characteristic tissue features. Every plant possesses a characteristic tissue structure, which can be demonstrated through study of tissue arrangement, cell walls, and configuration when properly
c) Silica

Particles of silica occur usually as incrustation on the cell walls of some plant species, for instance in the epidermal cells of many grasses or as masses in the interior of cells as in sclerenchymatous cells of cardamom seeds. Silica is soluble in all acids except hydrofluoric acid.

Ergastic substances especially calcium oxalate and carbonate crystals and silica are very useful in the identification distinguishing closely related plant species and in the detection of adulteration in crude vegetable drug evaluations. Other cell contents as waste product of metabolism occur in form of solutions in the cell sap of a great number of plant species across families. These include alkaloids, glycosides, volatile oils, tannins, resins as well as gums and mucilages. They are equally important in crude vegetable drug evaluations.

CHEMICAL EVALUATION

The chemical evaluation of our crude drug will include qualitative chemical tests, quantitative chemical tests, chemical assays, and instrumental analysis. The isolation, purification, and identification of active constituents are what are referred to as chemical methods of evaluation. Qualitative chemical tests include identification tests for various phyto-constituents like alkaloids, glycosides, tannins, etc. This is what is referred to as phytochemical screening.

Phytochemical evaluation of our crude drug will involves four different stages; the procurement of the raw material and quality control by macroscopy and microscopy; extraction, purification and characterization of isolates of interest.

Quantitative chemical tests for *Caryophyllus aromaticus* will include such tests as saponification value, ester values, methoxy - determination, acetyl value, volatile acidity and acid value.

The purity of the drug will also be ascertained by quantitative estimation of the active chemical constituents in them, which can be done by the conventional titrimetric and gravimetric method.
Melting Point

The melting point of a solid is the temperature at which it changes state from solid to liquid. Plant constituents have very sharp and constant melting points. As far as crude drugs are concerned, melting point range has been fixed due to mixed chemicals this could also be obtained for components of *Caryophyllus aromaticus*, the melting point of each component establishes purity of such component, and helps in the detection of adulterants.

Moisture Content

The moisture content of a drug will be responsible for decomposition of crude drugs either producing chemical change or microbial growth. So the moisture content of a drug should be determined and controlled. The moisture content is determined by heating a drug at 105°C in an oven to a constant weight. The moisture content of our crude drug will be determined using the method described above. The Following are the examples of crude drugs with the moisture content limit: the moisture content of Digitalis and Ergot should not be more than 5% w/w and 3% w/w, respectively.

Ultraviolet Light

Certain drugs fluoresce when the cut surface or the powder is exposed to ultraviolet radiation, and it is useful in the identification of those drugs. Some pieces of rhapontic, Indian, and Chinese rhubarb are very difficult to distinguish, and it is very difficult to distinguish in powdered form, but examination in ultraviolet light gives such marked differences in fluorescence that the varieties can be easily distinguished from each other. *Caryophyllus aromaticus* will be exposed to ultraviolet light to see whether there are components that fluoresce.

Ash Values

The determination of ash is useful for detecting low-grade products, exhausted drugs, and excess of sandy or earthy matter. Different types of ash values are used in detection of crude drugs like, total ash, acid-insoluble ash, water soluble ash, and sulphated ash.

Total ash
Extract of *Caryophyllus aromaticus* will be diluted to obtain different concentrations. A micro broth dilution assay for *Candida albicans* can be used for this evaluation. For the purpose of this evaluation, *Aspergillus species* cultures will be grown on Sabouraud dextrose agar at 37°C, until Sporulation occurs, typically for 5 days. The spores were harvested and the number of colony forming units (CFU), per milliliter was determined by plate serial dilution on Sabouraud dextrose agar plate. The diluted extract of different concentrations was inoculated with the spore suspension, and the minimum inhibitory concentration was determined at the lowest concentration, that inhibited visible fungal growth. The zone of inhibition for each concentration is determined.

**LARVICIDAL ACTIVITY**

For the purpose of this evaluation, the larva of *Aedes aegypti* (yellow fever mosquito) is used. This larva will be introduced into 100ml Beaker, filled to half its capacity with water. Acetone extract of *Caryophyllus aromaticus* of known concentration is then introduced into the Beaker, and the larvae are provided with animal food and yeast (powder). Percentage mortality is calculated after recording the initial number of larva and the number of larva dying after every 24 hours.