

NUTMEG OLEORESIN

Nutmeg Oleoresin is naturally obtained by the solvent extraction of ripened seeds of *Myristica fragrans*. The product has the characteristic aroma of nutmeg, with a pleasant, warm taste. It is a semi-solid, waxy resin with colours ranging from off white to light orange. Oleoresin is a mixture of resins and essential oils which obtained through extraction of various spices. Oleoresin has characteristics flavor and aroma of spices which are the same as the original. Oleoresin contains essential oils that make up the aroma, oleoresin also contains resins and compounds that did not volatile determine the characteristic flavor of spices.

Oleoresin extraction is generally done with organic solvents, such as ethylene dichloride, acetone, ethanol, methanol, hexane], ether and isopropyl alcohol. The choice of solvent affects the quality and quantity of oleoresin obtained. Oleoresin were used in food processing safer extracted using ethanol solvent. Extraction with polar solvents such as ethanol will be produced oleoresin with a low fat content. According Rismunandar nutmeg oleoresin extraction with gradual extraction of oleoresin will result in much more than the direct extraction. In the gradual extraction of nutmeg essential oils is taken beforehand through steam and water distillation, then the waste is dried and followed by extraction of the percolation or maceration, Oleoresin obtained was a mixture of resins and essential oils. Extraction oleoresin was done after distillation of essential oils which will suppress the loss of essential oils contained in the oleoresin during solvent evaporation process

In the food processing, nutmeg oleoresin are often added as a flavor. Food



products were usually added oleoresin or nutmeg essential oil was products such as meat and fish, pickles, sauces, soups, biscuits and bread or cake. These products are often damaged because of bacteria, yeast and fungi. In the nutmeg oleoresin contained essential oils, the main component of nutmeg essential oil was a hydrocarbon monoterpene (61-88% as α -pinene, β -pinene, sabinene) monoterpenes acid (5-15%), and aromatic ether (2-18% such as myristicin, elemicin, safrole). Nutmeg oil has 37 components and 31.3% was terpinen-4-ol, reported that nutmeg oil has antifungal activity.

Preparation of nutmeg oleoresin

Nutmeg oleoresin was obtained by two steps, distillation and followed by solvent extraction. Distillation using is water and steam distillation. Nutmeg with a water content of 10-15% removed from its shell and crushed using a dry blender, 200 grams of crushed nutmeg put in distillation equipment that has been filled with water and given filter, then in distilled during \pm 5 hours. Oil and water were accommodated in Clevenger removed and then separated using a separator funnel. Essential oil was obtained by separating water content by the addition of anhydrous Na_2SO_4 , and then calculated the essential oils obtained (% db).

Distillation residue was dried using a cabinet dryer until the moisture content of 10-15%. After drying residue crushed using a blender, then screened using a 20 mesh sieve. The part that passes of 20 mesh size is separated with the part which not passes, then each of them was extracted, the maceration extraction is used and fixing with 96% ethanol on ratio 1: 5 of material and solvent, extraction temperature is 40 ° C with stirring for 2.5 hours, the extraction is done by using hot plate stirrer]. Once extracted filtered with a vacuum filter coated filter paper to separate the filtrate and the residue then filtered again using Whatman paper no. 42 in order to ignore the mixture of residue and filtrate. The filtrate was cooled on 4 ° C for 1 1 hour, then was filtered to separate the nutmeg butter. Ethanol filtrate was evaporated using rotary evaporator on 40 ° C and 175

mbar. This extraction was repeated once again in the same way in order to obtain the filtrate 1 and 2 then each of them was weighed. The filtrate is a resin, the resin was mixed with essential oils obtained until a homogeneous. This mixture is called nutmeg oleoresin.