Vol. 5, Issue. 9, 2018, ISSN 2349-0780

Experimental Studies using different Solvents to Extract Butter from Garcinia Indica Choisy seeds

S. P. Dehankar[1], P. B. Dehankar[2]

[1,2]Assistant Professor
[1]Department of Technology, [2]TKIET, Warananagar
Shivaji University, Kolhapur
dehankarshital@gmail.com

Abstract: ***The extract from the Garcinia indica Choisy seeds (kokum) well known as kokum butter. This kokum butter has good properties of astringent, nutritive, emollient, and demulcent. Acetone, Ethanol and Chloroform were used as solvents for extraction of oil from kokum seed with various particle sizes at constant extraction temperature and residence time. At the end of fourth cycle, the maximum oil yield of 19.88 % for acetone, chloroform 29 % and for ethanol 15.8 % was obtained. Chloroform yielded the maximum oil from kokum seed among the three solvents with 77.6 % of solvent recovery. But, it was found that more quality product found by using acetone when gone through the analysis tests. This comparative study of solvents to extract butter form kokum seeds provides opportunities for the medicinal use of oil in addition to its popularity in a cosmetic in India.***

Keywords: Garcinia indica Choisy seeds, Kokum Butter, Solid-Liquid Extraction, Soxhlet Apparatus

I. INTRODUCTION

Kokum *(Garcinia indica* Choisy*)* is one of the native under exploited tree spices. It is mostly found in Konkan region of Maharashtra, Goa, Kerala, Karnataka and Surat district of Gujarat on the West Coast of India and to some extent in the Assam, Meghalaya and West Bengal forests. In spite of its incredible nutritive and medicinal properties, kokum is generally not cultivated systematically on orchard scale like that of mango, cashew nut etc [1,2].

The Kokum rinds are generally used in refreshing drinks and curries. The fruit is cardio tonic/piles/dysentery and heart tonic. Hydroxyl Citric Acid (HCA) extracted from Kokum is a fat-reducing medicine used against obesity.

The edible fat from kokum known as Kokum butter obtained from the seed kernels and used in candles ointments, soaps and pharmaceutical preparation specially in skin care products due to its ability to soften the skin and heal ulcers and also fissures on lips, hands and feet. It reduces the degradation of skin cells and restores elasticity [3,4].

Table I: The component fatty acids present by weight [4]

Myristic	0 - 1.2
Palmitic	2.5 - 5.3
Stearic	52 - 56.4
Oleic	39.4 - 41.5
Linoleic	1.7

Table II: Component glycerides (% by mol) [4]

Tristearin	1.5
Oleodistearin	68
Oleopalmitostearin	8
Palmitodiolein	20
Triolein	2

II. MATERIAL AND METHODS

Traditional Method

Firstly kokum seeds are collected and crushed. The powder of the seeds is mix with water and then the water is boiled up to kokum oil floats on the boiling water. After separating the oil layer from water it becomes solidified after cooling. This is known as Traditional Method. But the disadvantages in this method are it requires large amount of heat and time. Also the product obtained is not much purified.

Solvent Extraction (Leaching) Method

Extraction of Oil: Kokum seeds have collected from Chiplun market (Konkan region). The collected kokum seeds had dried in oven for about 15 min to remove the moisture in it after sun drying. After that the kokum seeds were crushed and separate it into different size using sieve shaker i.e. 1000 micron and 1190 micron. 50 grams of the crushed kokum seeds taken and 500 ml of solvent such as acetone, chloroform and ethanol (solid to solvent ratio = 1:10) into the Soxhlet apparatus. Adjust the temperature of heating mantle equal to the boiling point of solvent and allowed to complete the cycles of solvent such as 1, 2, 3, 4, 5 etc.

Solvent recovery: Then collect the extract from round bottom flask of the Soxhlet apparatus and put it into simple distillation unit to separate solvent from the kokum butter that is nothing but

solvent recovery. Finally collect the kokum butter and allowed to solidify at room temperature. Kokum butter obtained using solvents acetone, chloroform and ethanol was tested using different tests.

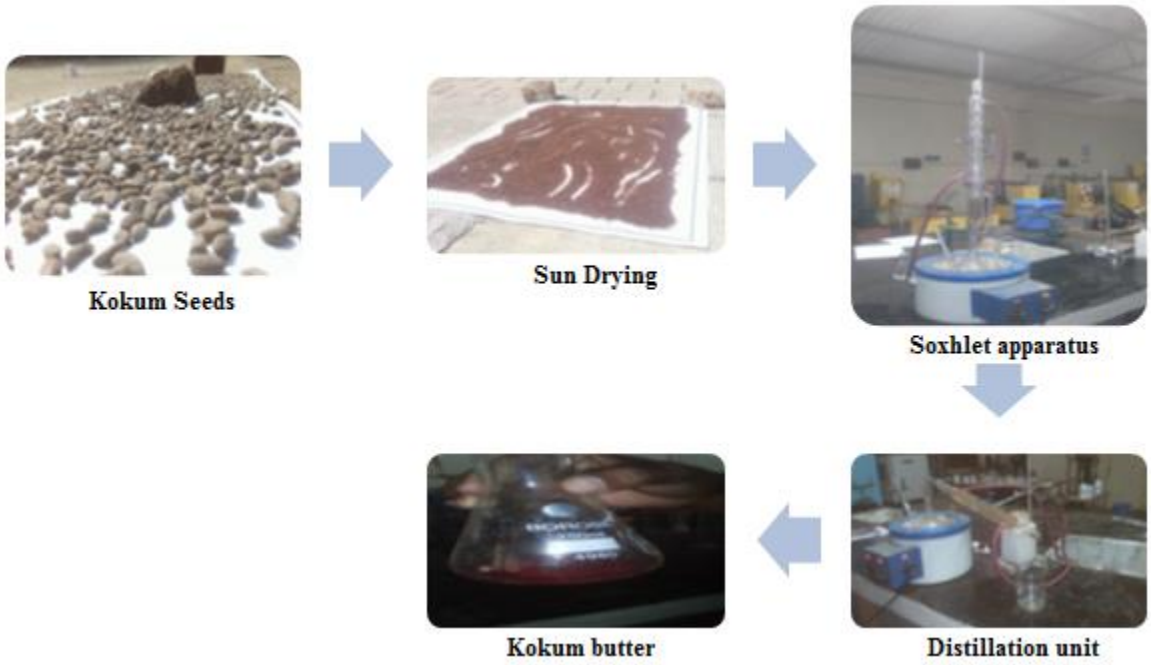

Fig 1: Process flow diagram for kokum butter from kokum seeds

III. RESULT & DISCUSSION

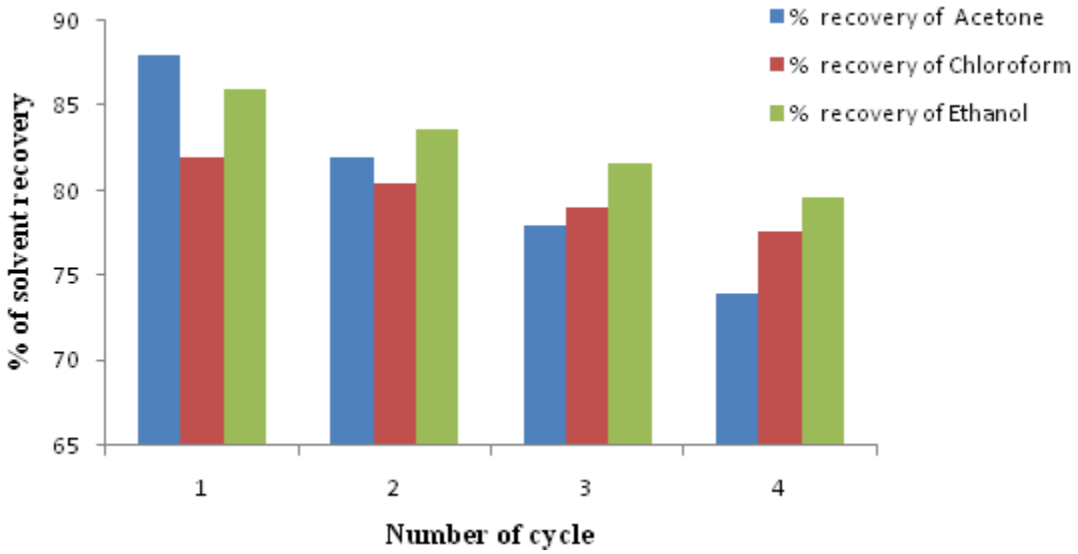

Fig 2: Comparisons of Number of Cycle & % Recovery of Solvent

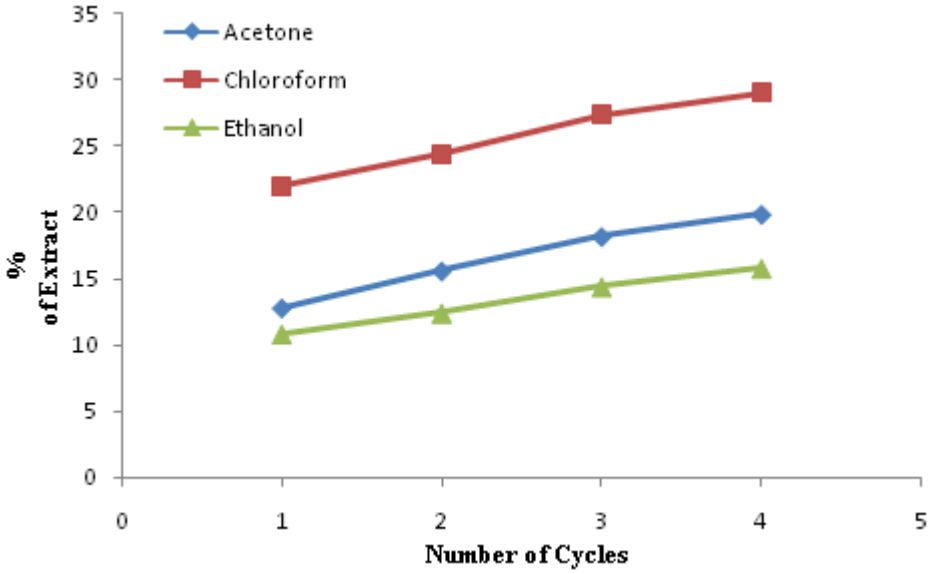

Fig 3: Number of Cycle & % of extract for different Solvents

IV. CONCLUSION

The percent extraction of Garcinia Indica Oil using solvent (percent recovery) as acetone was found to be 19.88 (74) and that for chloroform 29 (77.6) and for ethanol 15.8 (79.6). The yield of Garcinia Indica Oil using chloroform is more than acetone and ethanol; but more quality product found by using acetone. Also the acid values, saponification value, moisture content values of the acetone were in good agreement with standard values. Hence we conclude that acetone is more suitable solvent than chloroform and ethanol for extraction of Garcinia Indica Oil.

With increasing number of Soxhlet cycles, the yield of Garcinia Indica Oil increases up to the four number of cycle. After four number of cycle the yield of Garcinia Indica Oil become constant. Hence, optimum number of Soxhlet cycles would be four.

REFERENCES

[1] S.G. Korade, P.P. Relekar, K.H. Pujari, Studies on preparation of kokum (Garcinia indica Choisy) syrup from kokum rind juice, Theasian Journal Of Horticulture (2014), 9(1), 198-201.

[2] Miguel Braganza, Ajit Shirodkar, Resource Book on Kokum, Garcinia indica by Western Ghats Kokum Foundation (2012), Diamond Publications.

[3] Shrikant Baslingappa Swami, N.J. Thakor and S.C. Patil, Kokum (Garcinia Indica) and its Many Functional Components as Related to the Human Health: A Review, Journal Of Food Research And Technology (2014), 2(4), 130-142.

[4] Nandkumar M. Kamat, Proceedings and compendium Second National Conference on Kokum Goa University, March 4-5, 2005.

[5] D'mello et al., Evaluation of Antioxidant and Antihyperlipidemic activity of extract of garcinia indica, IJPSR (2010), 1 (12), 175-181.

[6] Hosamani K.M. et al., Renewable energy sources from Michelia champaca and Garcinia indica seed oils: A richn source of oil, Biomass and bioenergy (2009), 33, 267–270.

[7] Jena B.S. et al., Antiaflatoxigenic and antioxidant activities of Garcinia extracts, International Journal of Food Microbiology (2005), 101, 153– 160.

[8] Kureel R.et al.; Kokam A potential tree borne oilseed, National Oilseeds & Vegetable Oils Development Board (2009).

[9] Nayak C.et al., Bioactive constituents present in garcinia indica choisy and its potential food application: a review, International Journal of Food Properties (2010), 13, 441–453.

[10] R. Chaudhary et al., Rapid in vitro multiplication and conservation of Garcinia indica: A tropical medicinal tree species.

[11] Tamil Selvi et al., Inhibition of growth and aflatoxin production in Aspergillus flavors by Garcinia indica extract and its antioxidant activity, Food Microbiology (2003), 20, 455–460.

[12] Altuntas E., Ozgoz E., Taser O.F., Some physical properties of fenugreek (Trigonellafoenum-graceumL.) seeds, Journal of Food Engineering (2005), 71, 37–43.

[13] Amin M.N., Hossain M.A., Roy K.C., Effect of moisture content on some physical properties of lentil seeds, Journal of Food Engineering (2004), 65, 83–87.

[14] Balasubramanian D., Physical properties of raw cashew nut, Journal of Agricultural Engineering Research (2001), 78, 291–297.

[15] Baryeh E.A., Physical properties of millet, Journal of Food Engineering (2002), 51, 39–46.

[16] Samy RP, Pushparaj PN, Gopalakrishnakone P, Acompilation of bioactive compounds from Ayurveda,Bioinformation (2008), 3(3), 100-110.

[17] Saranya R, Thirumalai T, Hemalatha M, Balaji R, David E,Pharmacognosy of Enicostemmalittorale: A review, AsianPac. J. Trop. Biomed (2013), 3(1), 79-84.

[18] R S Bhande, P A Giri, Extraction of Garcinia Indica Oil From Kokum Seed, International Journal of Engineering Technology, Management and Applied Sciences (2017), 5(6), 723-727.