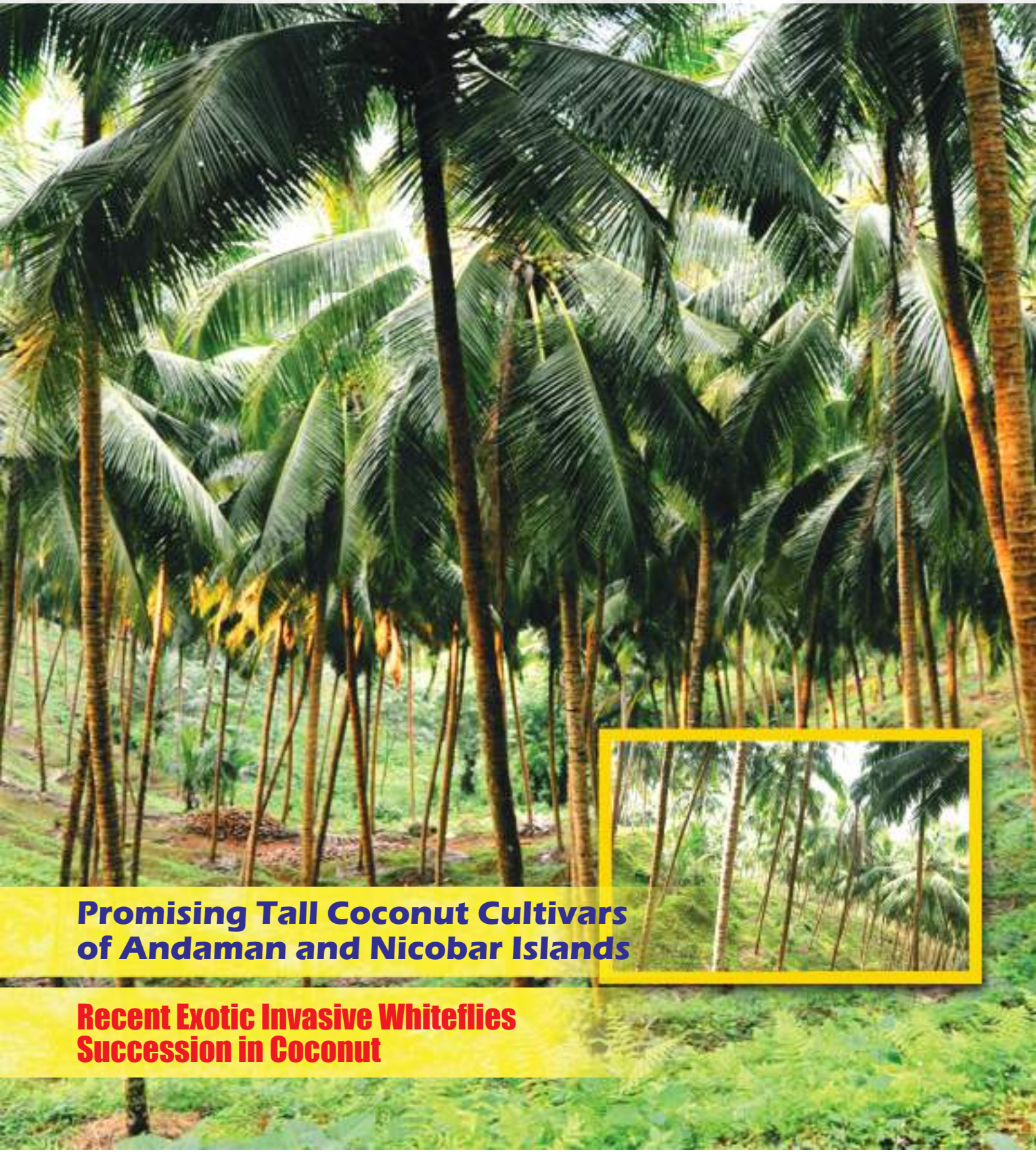
Vol.LXIV No.7 January - 2022 Pages-40 Price: Rs.6

Indian Coconut Journal



Promising Tall Coconut Cultivars of Andaman and Nicobar Islands

Recent Exotic Invasive Whiteflies Succession in Coconut

INDIAN
COCONUT
JOURNAL

Vol. LXIV No.7
January - 2022
Kochi - 11

Publisher
COCONUT DEVELOPMENT BOARD
Ministry of Agriculture and Farmer's Welfare,
Department of Agriculture and Co-operation,
Government of India
Kera Bhavan, Kochi - 682 011, India

Phone	:	0484- 2377266, 2377267, 2376553, 2375266, 2376265
Fax	:	91 - 0484-2377902,
Grams	:	KERABOARD
E-mail	:	kochi.cdb@gov.in
Website	:	www.coconutboard.gov.in

SUBSCRIPTION

Annual	Rs. 60.00
Single Copy	Rs. 6.00
Institutes / Libraries	
Annual	Rs. 200.00
Single Copy	Rs. 20.00

Articles, research papers and letters on different aspects of coconut cultivation and industry are invited for publication in this Journal. All accepted material will be paid for. The Board does not accept responsibility for views expressed by contributors in this Journal. All remittances and correspondence should be addressed to the Chairman, Coconut Development Board, Kochi - 682 011.

Coconut Development Board

The Coconut Development Board is a statutory body established by the Government of India for the integrated development of coconut cultivation and industry in the country. The Board which came into existence on 12th January, 1981, functions under the administrative control of the Ministry of Agriculture and Farmers Welfare, Government of India, with its headquarters at Kochi in Kerala State and Regional Offices at Bangalore, Chennai, Guwahati and Patna. There are five State Centres situated in the states of Orissa, West Bengal, Maharashtra and Andhra Pradesh and in the Union Territory of Andaman & Nicobar Islands. DSP Farms are located at Neriyamangalam (Kerala), Vegiwada (Andhra Pradesh), Kondagaon (Chhattisgarh), Madehpura (Bihar), Abhayapuri (Assam), Pitapalli (Orissa), Mandya (Karnataka), Palghar (Maharashtra), Dhali (Tamil Nadu), South Hichachara (Tripura) and Fulia (West Bengal) besides a Market Development cum Information Centre at Delhi. The Board has set up a Technology Development Centre at Vazhakulam near Aluva in Kerala.

Functions

❒ Adopting measures for the development of coconut industry. ❒ Recommending measures for improving marketing of coconut and its products. ❒ Imparting technical advice to those engaged in coconut cultivation and industry. ❒ Providing financial and other assistance for expansion of area under coconut. ❒ Encouraging adoption of modern technologies for processing of coconut and its products. ❒ Adopting measures to get incentive prices for coconut and its products. ❒ Recommending measures for regulating imports and exports of coconut and its products. ❒ Fixing grades, specifications and standards for coconut and its products. ❒ Financing suitable schemes to increase the production of coconut and to improve the quality and yield of coconut.

❒ Assisting, encouraging, promoting and financing agricultural, technological, industrial or economic research on coconut and its products. ❒ Financing suitable schemes where coconut is grown on large scale so as to increase the production of coconut and to improve its quality and yield and for this purpose evolving schemes for award of prizes or grant of incentives to growers of coconut and the manufacturers of its products and for providing marketing facilities for coconut and its products. ❒ Collecting statistics on production, processing and marketing of coconut and its products and publishing them. ❒ Undertaking publicity activities and publishing books and periodicals on coconut and its products.

The development programmes implemented by the Board under the project Integrated Development of Coconut Industry in India are- production and distribution of planting material, expansion of area under coconut, integrated farming for productivity improvement, technology demonstration, market promotion and Information and Information Technology. Under the Technology Mission on Coconut, the programmes implemented by the Board are development, demonstration and adoption of technologies for management of insect pest and disease affected coconut gardens, development and adoption of technologies for processing and product diversification and market research and promotion.

Refractive Index: A simple physical parameter for quality analysis of coconut oil

Rakhi Jose.,[1] Dr. Sreekala, G. S.,[2]

[1] Post Graduate student (MSc. Horticulture) Department of Plantation Crops & Spices, College of Agriculture, Vellayani, Kerala Agricultural University. [2] Assistant Professor, Department of Plantation Crops & Spices, College of Agriculture, Vellayani, Kerala Agricultural University.

Introduction

Coconut palm is generally known as Kalpavriksha and is known by different names in different regions like Tree of life" or "Tree of heaven" or "Tree of abundance". These names indicate its diverse and multiple uses and importance in lifestyle of individuals within the tropics. Each and every part of the palm is valuable and has multiple uses in agriculture, in health and religious fields. In South India and Southeast Asia, coconut oil is obtained mainly by processing of copra and is widely used for cooking. It occupies a major position as culinary fat in Kerala. Apart from its food value, it has medicinal and cosmetic value as it is rich in health factors (Ahuja et al., 2014).

Coconut oil belongs to a specific group of oils known as lauric oils. The major fatty acid present in the coconut oil is lauric acid (C12:0) and it accounts for 45 per cent of the total fatty acid composition. The health properties of coconut oil are contributed by the lauric acid. Moreover, palm kernel oil is also included in the category of lauric oil (Dayrit, 2014). The adulteration of fats and oils is not easy to detect when the adulterant has a composition near to that of the original oil. Palm kernel oil among oils is closest to coconut oil in terms of fatty acid saturation level. It blends easily with coconut oil and price is nearly 60 per cent of that of coconut oil thus making mixing perfect and the process profitable. But coconut oil adulterated with mineral oil is bad for health. Hence the quality of coconut oil was analyzed with the help of refractive index.

Materials and Methods

Sample Collection

Pure coconut oil was obtained from the coconut expeller and five different brands of coconut oil samples from different shops were collected and analyzed separately. Pure coconut oil obtained from the expeller was mixed separately with 1, 5, 10, 15, 20 and 30 per cent of palm kernel oil and mineral oil. The treatments of the experiment were twenty.

Determination of Refractive Index

Refractive Index of the oil at 40°C was determined by using a Butyro-refractometer (ATAGO RX – 50001) (Fig 1). Two drops of sample was placed on the lower prism. Prisms were closed and mirror was adjusted to get the sharpest reading. Refractive index is greatly affected by temperature, and hence care was taken to keep temperature constant. Temperature correction was undertaken automatically in the instrument itself. The reading of Butyro refractometer was converted to refractive index with the help of the table of FSSAI (FSSAI, 2015).

Results and Discussion

Adulteration and purity of oil can be checked by the refractive index. Pearson (1981) observed that refractometer could be used to determine the refractive index of oil and the value obtained for each oil would be unique.

The effect of refractive index on the quality assessment of oil samples is presented in Table 1.

Fig 1. Refractometer

According to FSSAI (2015), refractive index is defined as the ratio of velocity of light in vacuum to the velocity of light in the oil or fat or it is described as the ratio between the sine of angle of incidence to the sine of angle of refraction. Refractive index of the samples can be measured by using a suitable refractometer. FSSAI standard for refractive index of coconut oil at 40°C is 1.4481-1.4491.

Atasie and Akinhanmi (2009) studied the physico chemical characteristics of palm kernel oil and the refractive index obtained was 1.453. Ariponnammal (2012) reported that percentage of adulteration in coconut oil was about thirty percent of palm oil and it could be detected using Abbe's refractometer of good accuracy. In a study conducted by Srivastava et al. (2016), it was found that the refractive index of copra oil, hot extracted virgin coconut oil and cold extracted virgin coconut oil were 1.4480. Bahadi et al. (2019) studied the physico chemical properties of Malaysian crude palm kernel oil (CPKO) and reported that the refractive index of crude palm kernel oil at 28°C was 1.455. According to FSSAI (2015), refractive index for palm kernel oil is 1.4490-1.4520.

The refractive index of samples T1 to T13 which included pure coconut sample collected from expeller, branded coconut oil, coconut oil mixed with 1, 5, 10, 15, 20 as well as 30 per cent palm kernel oil and 1 per cent mineral oil was 1.449. The highest refractive index was noticed for treatment T20 (mineral oil) and the value obtained was 1.467. This was followed by T18 (coconut oil mixed with 20 per cent mineral oil) which showed a refractive index of 1.453. The refractive index started changing

Table 1. Refractive Index at 40°C of oil samples

Treatments	Refractive Index at 40°C
T1 (Pure sample)	1.449
T2 (Branded sample 1)	1.449
T3 (Branded sample 2)	1.449
T4 (Branded sample 3)	1.449
T5 (Branded sample 4)	1.449
T6 (Branded sample 5)	1.449
T7 1% PKO+ 99 % Coconut oil	1.449
T8 5% PKO + 95 % Coconut oil	1.449
T9 10% PKO+ 90% Coconut oil	1.449
T10 15% PKO+ 85 % Coconut oil	1.449
T11 20% PKO + 80% Coconut oil	1.449
T12 30% PKO+ 70% Coconut oil	1.449
T13 1% Mineral oil + 99% Coconut oil	1.449
T14 5% Mineral oil + 95 % Coconut oil	1.450
T15 10% Mineral oil+ 90% Coconut oil	1.451
T16 15% Mineral oil+85% Coconut oil	1.451
T17 20% Mineral oil+ 80% Coconut oil	1.452
T18 30% Mineral oil+ 70% Coconut oil	1.453
T19 PKO	1.450
T20 Mineral Oil	1.467
SE(m) ±	0.00000068
CD (0.05)	0.0001

from coconut oil mixed with 5 per cent mineral oil onwards. Refractive index started increasing when more quantity of mineral oil substituted the coconut oil. In the analysis, treatment T19 (palm kernel oil) obtained a refractive index (1.450) which was above the value of pure coconut oil.

In the experiment all the branded coconut oil samples showed a refractive index within the standard value. When palm kernel oil was used as an adulterant in different concentrations below 30 percent, the values obtained were within the FSSAI standard for coconut oil and it was difficult to detect the adulterant. When mineral oil was used as an adulterant, adulteration could be detected from the addition of 5 per cent of mineral oil.

Conclusion

All branded coconut oil samples and coconut oil mixed with different concentrations of palm kernel oil obtained a value within the FSSAI standard while mineral oil adulterated samples exceeded the FSSAI limit. High refractive index (1.4674) was noticed for mineral oil. Hence mineral oil adulterated samples was easily identified with the help of refractive index. ■

References

• Ahuja, S. C., Ahuja, S., and Ahuja, U. 2014. Coconut- history, uses, and folklore. Asian Agri-Hist. 18 (3): 221-248. • Atasie, V. N. and Akinhanmi, T. F. 2009. Extraction, compositional studies and physico-chemical characteristics of palm kernel oil. Pak. J. Nutr. 8 (6): 800-803. • Ariponnammal, S. A. 2012. Novel method of using refractive index as a tool for finding the adulteration of oils. Res. J. Recent Sci. 1 (7): 77-79. • Bahadi, M., Yusoff, M. F. M., Salimon, J., Jumaah, M. A., and Derawi, D. 2019. Physicochemical characteristics of Malaysian crude palm kernel oil. Malaysian J. Chem. 21 (2): 17-27.• Dayrit, F. M. 2014. Lauric acid is a medium-chain fatty acid, coconut oil is a medium-chain triglyceride. Philipp. J. Sci. 143 (2): 157-166. • FSSAI [Food Safety and Standards Authority of India]. 2015. Lab Manual 2 Manual of Methods of Analysis of Foods: Oils and Fats [on-line]. Available: https://old.fssai.gov.in/Portals/0/Pdf/DraftManuals/OILS_AND_FAT.pdf. [15 Jan. 2019]. • Pearson, D. 1981. The Chemical Analysis of Foods (8th Ed.). J. A. Churchill, London, 535p. • Srivastava, Y., Semwal, A. D., and Majumdar, A. 2016. Quantitative and qualitative analysis of bioactive components present in virgin coconut oil. Cogent Food Agric. 2 (1): 1164929.

Online Payment System for Coconut Journal Subscription

Coconut Development Board has introduced the online payment system for subscription for Coconut Journals. Both the new subscribers as well as the existing subscribers can make the payment and start or renew their subscription through the online mode.

For more details visit *www.coconutboard.gov.in*. or *https://www.coconutboard.in/journalsubscription/home.aspx*. The payment can be remitted through Board's Account: State Bank of India, Iyyattil Jn., Ernakulam Branch: Account No.- 61124170321,IFSC: SBIN0031449 through Demand Draft/ NEFT / BHIM / Phone Pe /Google Pay or PayTm.

Subscription payable (inclusive of Tax):		
	Annual Subscription	Life time subscription*
Individual Subscribers		
Indian Nalikera Journal	Rs. 40/-	Rs. 1000/-
Indian Coconut Journal	Rs. 60/-	Rs. 1600/-
Bharatiya Nariyal patrika**	Rs. 40/-	Rs. 1000/-
Institutes/ Libraries		
Indian Coconut Journal	Rs. 200/-	Rs. 5000/-
** 30 years., **Quarterly*		