https://doi.org/10.29321/MAJ.10.A04725

Industrial uses of Cashew and its Products.*

By C. M. JOHN,

Oil Seeds Specialist, Coimbatore.

Introduction. The cashew (*Anacardium occidentale*, L.) has, of late, received commercial importance chiefly on account of the great demand for its edible kernels. Believed to be a native of South America, the cashew that was introduced on the West Coast of India by the Portuguese, has now established itself as a commercial crop in the States of Cochin and Travancore and in the districts of Malabar and South Kanara. It is now seen to be spreading to other parts of this Presidency, on account of its capacity to thrive under widely varied conditions of soil, climate and rainfall. The possibilities of further extension in its cultivation in regard to its occupation of land now left uncultivated due to subnormal fertility, indifferent rainfall or other reasons, cannot be under-rated.

The importance of the cashewnut in industry can easily be gauged when we note that according to the latest available figures, about 10,192 tons of cashew kernels valued at Rs. 11,411,170 were exported from British India during the year 1936—37. Of this, S. India contributed 8,799 tons valued at Rs. 9,971,567 while Bombay was responsible for the remainder. The value of exported cashewnut kernels from India is about 82 per cent of the world export trade in them which amounted to $3\frac{1}{2}$ million American dollars in 1936 (i. e., about 14 million rupees).

Commercially, to-day, the cashew kernels alone are known to any extent. The cashew, however, yields certain other products, each of which foster possibilities of industrial utilisation. Though the economic uses of these products have been established, they form, as yet, only a fertile field of unexplored wealth. This note collates the already recorded uses to which the products of cashew can be put, and it is hoped that it would stimulate interest both in regard to the extended cultivation of cashew and its increased industrial use.

The cashewnut. The cashew is chiefly cultivated for the valuable kernels that it yields. In India the cashew kernels both "raw" and "roasted" find a place in a variety of household preparations. In Europe and America the kernel is largely used as a "dessert" nut and for making confectioneries, particularly in the manufacture of nut chocolates. It provides a cheap source of protein and is considered better than other nuts

* Contribution No. 15 of the Oil Seeds Section of the Madras Department of Agriculture.

A contribution to the Symposium on "The Industrial Utilization of Agricultural Products in India" held under the auspices of the Indian Science Congress during its Madras Session in January 1940.

because of its high biological value. Table i below gives a comparative statement of the protein content, true digestibility and biological value of cashew and other commercial nuts.

TABLE I. Protein content, true digestibility and biological value of cashew and other nuts.*

Descripton of nuts.	Protein % (Crude)	True digestibility.	Biological value.
Cashewnut fresh	19·52	96·23±0·16	72·50±0·66
Blanched almonds	21·94	93 95±0·23	50·84±0·37
English walnuts fresh	21·16	84·11±0·22	55·89±0·92
Groundnut raw	28·25	97·39±0·27	57·90±1·1

* From Mitchell, and Readles (1937).

The cashewnut is also said to contain vitamins A and B_2. It contains about 40 per cent of oil of high nutritive value equal to that of almond oil and superior to olive oil. The oil, it is reported, can be utilised with advantage in certain pharmaceutical preparations. It is not of much interest commercially at present as the price of the kernels is too high to be utilized for production of oil.

In spite of all these advantages the cashew kernel is marketed in India in a very indifferent manner. No proper grading or hygienic packing of the stuff is undertaken in the internal markets though some attempt in this line is made with the stuff exported. Joachim (1936) in his studies in the "Vita-pack" process for preserving cashewnuts has found that the packing of well dried cashewnuts in well sealed receptacles containing dry carbon di-oxide gas is a very effective means of preserving them for no less than eight months (the duration of the experiment). The trials also appear to indicate that provided that the nuts are thoroughly dried, they can be preserved for this period of time in well filled and well sealed containers without carbon di-oxide. An organized production, grading, packing and marketing, would thus, certainly induce greater utilisation of the produce in the confectionery trade and better sales both in the home and foreign markets.

The Shell. The cashewnut shell contains 29 per cent of a reddish brown oil of which 10 to 15 per cent is obtained during the roasting of the nuts, which is commonly done in open pans over a small circular earthern furnace. As nuts get roasted the oil exudes out and is drawn off at one end. The oil contains anacardic acid, gallic acid and cardol. The shell oil finds extensive use in the preparation of varnishes, synthetic resins, moulding compositions, insulating coating, inks etc., as a preservative paint for boats and fishing nets, and as a protective for floor and wooden rafters against termite attack. The acrid oil is medicinal and "has been used as an anaesthetic in leprosy and as a blister in warts, corns and obstinate ulcers". In combination with kerosine or crude oil, it is lethal to mosquito larvae. In addition to these uses, further interest in anacardic acid which

forms 90 per cent of the corrosive oil has arisen recently as an antiseptic for textiles, the anilide and analagous derivatives of the acid being expected to combine the antiseptic properties of "shirlan" with a wetting power from its polar hydroxyl and hydrophobic long chain alkyl residue.

It is estimated that about 11,000 gallons of this oil are annually exported to Europe and particularly to America under the trade name of "Cardole oil". The price of the oil varies from 8 to 12 annas per gallon. It is also computed that "about 32,000 tons of raw cashewnuts are roasted every year in India and thus at the present rate of kernel production nearly 13,000 tons of roasted shells containing nearly 18 per cent of oil are available which could yield 53,000 gallons of the roasted nut shell oil". It may be possible to improve the process of roasting with a view to greater recovery of the oil.

The cashewnut shell is at present largely used as fuel in the process of roasting the nuts. The partly burnt shells from a previous charge form the fuel for the next charge of the nuts. This method is wasteful for the shell is valuable for other purposes. It gives on destructive distillation a combustible gas of a calorific value which compares favourably with coal gas. A ton of cashew shells gives about 6,000 cubic feet of gas. The shell charcoal which is one third of the shell has a calorific value of coal and is smokeless.

The Cashew Apple. The apple which is the swollen pedicel of the fruit is edible and on a small scale is eaten fresh or preserved with sugar. It has antiscorbutic properties containing as it does vitamin C. It is determined that 1 ounce of the fruit contains 120 milligrams of vitamin C and the normal requirement for a man is 50 milligrams. By fermentation either alcohol or vinegar can be obtained from it. "Dr. F. Marsden finds that 100 gms. of the apple yields 70 c. c. of juice containing 11·2 grams of invert sugar and on an average 3·8 per cent of alcohol". The invert sugars of the apple are valuable for inclusion in infant and invalid foods. These can be made available by converting the juice of the apple into a syrup which preserves the invert sugars. When mixed with iron sulphate the juice is said to make a good hair dye.

The cashew apple, thus, should be given further attention. An attempt should be made to utilise this fruit in the different ways indicated above instead of allowing it to be wasted. Preservation of the apples particularly of the sweeter varieties in sugars can be organised as a cottage industry.

The Cashew Wood. Cashew timber is used for making country boats and packing cases. The wood is red, moderately hard, close grained and weighing 38 lb to the cubic foot. The resinous gum which exudes from the bark of the tree is said to be deterrent to insects and can therefore be used for book binding. It is also useful in tanning. The sap obtained from the incisions on the bark is utilized as an indelible marking ink. The charcoal of the wood is highly estimated by the iron smiths of *Tavoy* and West Coast.

Conclusion. These are but a few of the many and diverse uses to which cashew and its products can be put. Many of them easily lend themselves to industrial exploitation. More than that, the products of cashew can replace many of the materials that are at present of necessity being imported into this country. Where India could be self sufficient in its needs of small scale industries, by the utilisation of the wealth that is so easily procurable, cashew has abundant potentialities. A little more research on the side of industrial utilization of the different products should put the cashew industry of India on a sound basis for fuller expansion.

References.

1. Agricultural Products of the World market. No. 4. Oil and Fats—Production and Internal Trade (1939). International Insti. of Agri. Rome. Part I: 251.

2. Brain, C. K. (1938). Notes on the cashew nut. *Rhodesia Agri. J. 35*: 103—105.

3. Cashewnuts—Packing Experiment in Ceylon (1934). *Bull. Imp. Inst. 32*: 288.

4. Chemical notes (1938). *Trop. Agri. 15*: 239.

5. Extract (1937). *J. British Honduras Agri. Soc. 3*: 9.

6. Ittyachan, C. T. (1939). Cashewnuts. *Mad. Agri. J. 27*: 313—324.

7. Jenkins, W. J. (1938). The cashewnut Industry in Western India. *Bull. Imp. Inst. 36*: 44—52.

8. Joachim, A. W. R. (1936). The curing of cashewnuts for export. *Trop. Agri. 87*: 22—25.

9. Joachim, A. W. R. (1936). The curing of cashewnuts. *Imp. Bur. of Fruit Prod. Hort. 6*: 216

10. Mitchell, H. H. and Jessie R. Readles (1937). Nutritive value of the proteins of nuts in comparison with the nutritive value of beef proteins. *J. Nut.* 14: 597—607.

11. Padmanabha Iyer, A. (1934). The cashew industry in Mysore (1936). *Eco. J. 20*: 645—646

12. Patel, C K. Studborough, J. J and Watson, H. E. (1923). Cashew kernel oil. *J. Ind. Insti Sci. 7*: 111—129

13 Patel, N. M. and Patel, M. S. (1936). Cashewnut shell oil and a study of the changes produced in the oil by the action of heat. *Jour. of the Uni. Bombay. 5*: II: 114—131

14. Paul, W. K. C. (1936). The cashewnut industry of South India. *Trop. Agri. 87*: 166—173.

15. Pillay, P. P. (1935). On Anacardic acid and Tetra-hydro-anacardic acid. *J. Ind. Chem. Soc. 12*: 226.

16. Rama Rao, G. (1938). The recovery and use of Agricultural wastes—Part II, The destructive distillation of Cashew shells. *J. Ind. Chem. Soc. Ind. and News Edn. 1*: 141.

17. Sayeed, I. A. (1932). The cashewnut or the tropical almond. *Poona Agri. Coll. Mag. 23*: 33—38.

18. Sayeed (1939). The development of the cashewnut industry in India. *Agri. and Livestock in India. 29*: 26—41.

19. Srinivasan, M. (1934). Preparation of sugar syrup from cashew apples. *J. Ind. Inst. Science. 17*: 85—94.

20. Watt, G. W. (1889). Dictionary of Economic Products of India. *1*: 232—233.