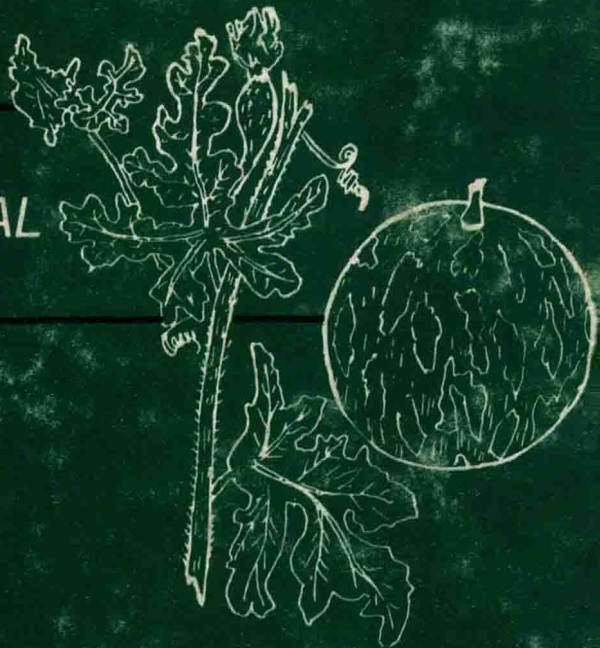


OILSEEDS AND OILMILLING IN INDIA

A CULTURAL
AND HISTORICAL
SURVEY



K. T. Achaya



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K.T. ACHAYA



OXFORD & IBH PUBLISHING CO. PVT. LTD.

New Delhi

Bombay

Calcutta

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ISBN 81-204-0475-0

*Published by Mohan Pramlani for Oxford & IBH Publishing
Co. Pvt. Ltd., 66 Janpath, New Delhi 110 001 and printed by
Sunil Printers, New Delhi*

1-AO-10

Preface

A few years ago I was drawn into studying the history of foods and food plants in India. I had earlier had a long association with the area of oils and fats, and it seemed opportune to marry these interests in a fully-illustrated historical book on the oilseeds of India. I little realised what I had let myself in for. There were times when I almost despaired at the range of the material that confronted me, and there will be many deficiencies in an end-product dealing with so wide a canvas.

The 67 oil-bearing materials chosen for this book have been classed for convenience into 11 categories. Some are historical oilseeds of considerable antiquity, others are more recent introductions into India, and yet others are oleaginous byproducts of crops cultivated as a source of other commodities. These 21 materials are all fairly familiar as sources of oil. The rest however are more or less unique to India. Some are already quite largely exploited in the country for their oil, others are just beginning to enter the picture, and yet others have the potential to do so. Many of these fats are interesting in having either a striking fatty acid and glyceride composition (like the vegetable hard fats), or unusual fatty acid components (like kamala seed oil or chaulmoogra oil), or unique lipid associates (as exemplified by neem oil and karanja oil) that have striking biological activity.

This volume is not a discussion of the current oilseed and oil-milling scenario in India, though this is succinctly summarised in a brief concluding section; nor is modern technology dealt with except in passing. Briefly, this is a book of history and culture centred on oilseeds. Any topic therefore is treated in historical perspective: the oil-bearing materials themselves, their agriculture, marketing and use in daily ritual and medicine, the devices that have been evolved for winning oils from oilseeds, and the outlets, both domestic and utilitarian, for various oils in India. This has meant delving into the enormous wealth of Sanskrit literature (there are an estimated 700,000 manuscripts in the language), into the rich storehouse of Indian folklore and mythology, into archaeological findings and epigraphic records, into history and botany, and into the prolific medical lore of India, both formal and domestic.

A difficulty well-recognised in writing about anything historical in India is the curious reticence shown by writers of the past to factual accuracy. The ancient oilseed-crushing device, the ghani, is hardly ever

mentioned. It is never described, so its mechanical evolution can only be guessed at. The presence of the Greeks in south India in the first and second centuries A.D. is mentioned quite casually in the Tamil literature of the period; it was even considered a figment of the imagination till the discovery about 40 years ago of a Roman trading warehouse strewn with amphorae that still bore the resinous dregs of wine brought there 18 centuries ago. Indian dynasties were established in several countries of South-East Asia since about the start of the Christian era, continuing thereafter for 10 to 15 centuries. Yet, of these momentous events, Indian epigraphs and literature have so little to say that, from perusing the latter, their very existence would not be suspected. In the Yucatan province of Mexico was recently found an inscription dated 923 A.D. in an Indian script, recording the visit there of a ship exploring the coastline and led by an Indian captain named Vusaluna.

In putting this volume together, many organisations and persons have contributed in various ways. The Khadi and Village Industries Commission, Bombay furnished me with literature on modern developments concerning the ghani, and with a very large number of photographs and drawings. From his personal collection, Mr. H.G. Muralidhara of Bangalore placed at my disposal a mass of literature on the collection and utilisation of non-traditional Indian oilseeds. Many librarians allowed me access to their books and journals: those of the Department of Anthropology and of Epigraphy in Mysore, and, in Bangalore, those of the National Dairy Research Institute, the Indian Institute of Science, the Department of Agriculture, the University of Agricultural Sciences, the Mythic Society, the Indian Institute of World Culture and the State Central Library. The National Dairy Development Board made it possible for me to visit certain centres in Gujarat State, like Dwaraka.

The figures and plates that illustrate the book were drawn from many sources. The Khadi and Village Industries Commission, Bombay has already been mentioned; others were the Oil Technological Research Institute, Anantapur; the Central Food Technological Research Institute, Mysore; the Archaeological Survey of India, New Delhi; The Mythic Society, Bangalore; the Indian Council of Agricultural Research and the Indian Agricultural Research Institute, New Delhi. Individuals who kindly furnished illustrations were R.N. Bose, Calcutta, sole executor to the estate of the late Prof. N.K. Bose; Dr. Vishnu-Mittre, Lucknow; G.V. Ramaswami, Valavanur; Sivapriyananda, Mysore, and A. Gautama, Anantapur. One donor wishes to remain anonymous. For many services I am grateful to the photographic sections of the National Aeronautical Laboratory, Bangalore and the Central Food Technological Research Institute, Mysore. Technological Research Institute, Mysore. Special thanks are due to the draftsman who so elegantly visualised my intentions from poor sketches.

I am deeply grateful for three grants which have made it possible to market this book at a lowered price: a substantial donation from the Vallabhdas VasANJI and Smt. Kabubai Vallabhdas Mariwala Charity Trust, and handsome grants from Hindustan Lever Ltd. and Lipton India Ltd.

I can only hope that this volume, treating Indian oilseeds in a cultural and historical setting, will stimulate further interest in this field in future.

Bangalore

K.T. ACHAYA

OIL-BEARING MATERIALS OF INDIA TREATED IN THIS BOOK

Common names employed, and current botanical nomenclature

Group A. Historical oil-bearing materials		Group C. Oil-bearing materials derived as byproducts of cultivated crops
A1. Sesame	<i>Sesamum indicum</i>	C1. Ricebran <i>Oryza sativa</i>
A2. Cottonseed	<i>Gossypium</i> spp.	C2. Tapioca seed <i>Manihot esculenta</i>
A3. Rape-mustard	<i>Brassica</i> spp.	C3. Maize germ <i>Zea mays</i>
A4. Coconut	<i>Cocos nucifera</i>	C4. Tobacco seed <i>Nicotiana</i> spp.
A5. Linseed	<i>Linum usitatissimum</i>	C5. Rubber seeds <i>Hevea brasiliensis</i>
A6. Castor	<i>Ricinus communis</i>	C6. Tung seeds <i>Aleurites</i> spp.
A7. Niger	<i>Guizotia abyssinica</i>	C7. Jute seeds <i>Corchorus</i> spp.
A8. Safflower	<i>Carthamus tinctorius</i>	C8. Spent coffee grounds <i>Coffea</i> spp.
Group B. Newer oil-bearing materials		C9. Tea seeds <i>Camellia</i> spp.
B1. Groundnut	<i>Arachis hypogaea</i>	Group D. Oilseeds with unusual lipid associates
B2. Soybean	<i>Glycine max</i>	D1. Neem <i>Melia indica</i>
B3. Sunflower	<i>Helianthus annuus</i>	D2. Karanja <i>Pongamia pinnata</i>
B4. Oil palm	<i>Elaeis guineensis</i>	D3. Kusum <i>Schleichera oleosa</i>
		D4. Nahor <i>Mesua ferrea</i>
		D5. Undi <i>Calophyllum inophyllum</i>
		D6. Rayana <i>Amoora rohituka</i>

- Group E. Oilseeds carrying vegetable hard fats**
 E1. Mahua *Madhuca indica*
 E2. Sal *Shorea robusta*
 E3. Dhupa *Vateria indica*
 E4. Kokum *Garcinia indica*
 E5. Tamal *Garcinia morella*
 E6. Phulwara *Diploknema butyracea*
- Group F. Oilseeds carrying soap-making oils**
 F1. Khakan-Pilu *Salvadora* spp.
 F2. Pisa *Actinodaphne hookeri*
 F3. Chirandi *Litsea glutinosa*
- Group G. Oilseeds with oils of unusual nature**
 G1. Maroti *Hydnocarpus laurifolia*
 G2. Kamala *Mallotus philippinensis*
 G3. Pinari *Sterculia foetida*
 G4. Malkanguni *Celastrus paniculatus*
- Group H. Oilseeds from shrubs**
 H1. Ratanjyoti *Jatropha curcas*
 H2. Gokhru *Xanthium strumarium*
 H3. Hurhur *Cleome icosandra*
 H4. Somraji *Vernonia anthelmintica*
 H5. Argemone *Argemone mexicana*
- Group I. Oilseeds from trees that yield other commercial products**
 I1. Akra *Calotropis* spp.
 I2. Simul *Bombax ceiba*
 I3. Kapok *Ceiba pentandra*
 I4. Baheda *Terminalia belerica*
 I5. Palas *Butea monosperma*
 I6. Teak *Tectona grandis*
 I7. Tamarind *Tamarindus indica*
- Group J. Oilseeds from fruits**
 J1. Mango kernel *Mangifera indica*
 J2. Thumba *Citrullus colocynthis*
 J3. Water melon *Citrullus vulgaris*
 J4. Musk melon *Cucumis melo*
 J5. Lime *Citrus aurantifolia*
 J6. Sweet orange *Citrus sinensis*
 J7. Papaya *Carica papaya*
 J8. Sitaphal *Annona squamosa*
 J9. Sapota *Manilkara achras*
 J10. Grape *Vitis vinifera*
 J11. Kapittha *Limonia acidissima*
- Group K. Oils from vegetables**
 K1. Ambadi *Hibiscus cannabinus*
 K2. Okra *Abelmoschus esculentus*
 K3. Tomato *Lycopersicon lycopersicum*
 K4. Chilli *Capiscum annuum*

INDIAN CHRONOLOGY

LITERARY	HISTORICAL
Munda (aboriginal) languages	Munda and Nāgā tribes
Indus Valley language (undeciphered)	Indus Valley (Harappan) towns:
Sanskrit works:	Mohenjodaro
<i>R̥gveda</i>	2500 BC
<i>Atharvaveda</i> , <i>Yajurveda</i> , <i>Brāhmanas</i>	1500 BC to 1000—800 BC
<i>Upanishads</i>	Chanhudaro
Various <i>Sūtras</i>	Lothal
Pāṇini's grammar	Kālībangan
Buddhist canon, Jātaka tales	Entry of Āryans in waves through the northwest
<i>Purānas</i>	Protohistoric culture sites: Navatoli/Maheswar
<i>Mahābhārata</i> , in which is included the <i>Bhagvad Gīta</i>	Chirand
<i>Ramayana</i>	Inamgaon
<i>Susruta Samhitā</i>	Atranjikerhera
<i>Charaka Samhitā</i>	Nevasa
Kautilya's <i>Arthashastra</i>	Ahichchhatra
<i>Manusmṛiti</i>	Buddha's life
<i>Yāgyavalkya Smṛiti</i>	Alexander's conquest
Kālīdāsa's plays	Megasthenes
Someśhvara's <i>Mānasollāsa</i>	Ashoka the Great
	2500 BC
	to
	1500 BC
	From 1700 BC
	2000—1400 BC
	2000—1300 BC
	1600—700 BC
	1500—200 BC
	1300 BC
	—
	563—483 BC
	327—325 BC
	c. 320 BC
	273—232 BC

Tamil literature:				45 AD
<i>Tolkāppiyam</i>				
<i>Puranānooru</i>	1st cent. AD			
<i>Nāḷadiyār</i>	2nd cent. AD			1st and 2nd cents. AD
Greek writers/works:	7th cent. AD			
Writers accompanying Alexander	327 BC—325 BC			From 1st cent. AD onwards, up to the 14th cent. AD
Strabo	65 BC— 25 AD			
Pliny	23 AD— 79 AD			
<i>Periplus Maris Erythraei</i>	1st cent. AD			
Chinese pilgrim-writers:				
Yuan Chwang	629—643 AD			320—500 AD
I-tsing	671—695 AD			606—647 AD
Muslim writers:				
Al-Biruni	1030 AD			712—1001 AD
Ibn Battūta	1342 AD			1001—1260 AD
Abul Fazl's <i>Ain-i-Akbari</i>	1590 AD			1260—1526 AD
European writers:				
Marco Polo	1293 AD			1526—1530 AD
Garcia da Orta	1563 AD			1556—1605 AD
Linschoten	1598 AD			1605—1628 AD
Mandelslo	1638 AD			1658—1707 AD
Niccolao Manucci	1680 AD			1498 AD
Van Rheede	1686 AD			
Ovington	1689 AD			16th and 17th cents. AD
Alexander Hamilton	1727 AD			1757 AD
William Sleeman	1840 AD			1757—1947 AD
George Watt	1883—1908 AD			1869—1948 AD
				15 August 1947
Discovery of the monsoon seasonal winds to India by Hippalus				
Extensive trade between South India and the Roman Empire				
Hindu dynasties established in several countries of South-East Asia				
Gupta empire				
Emperor Harshavardhana				
Early Muslim kingdoms:				
Arab rulers in Sind				
Raids into west and North India				
Turkish and Afghan sultans				
The Moghul empire:				
Babar				
Akbar				
Jahangir				
Aurangazeb				
Vasco da Gama's landing in south India				
Transfer of flora from South America and Mexico to India				
Battle of Plassey				
British rule in India				
Mahatma Gandhi				
Indian Independence day				

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