

INDIAN OILPRESS (GHĀNI)

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Culinary use of animal body and milk fats, and of vegetable oils, appears to date from Harappan times, but how they were produced is not known. By about 500 BC, an oilpressing machine is specifically noted in Sanskrit literature, though never described, while guilds of oilmen find frequent mention. The oldest stone presses found have been dated to the 1st/2nd centuries AD. The three current terms for oilpress all appear to be derived from Sanskrit. *Ghāni* and *kolhu* are colloquial spoken words which occur in Sanskrit inscriptions from about the 5th century AD (with one notable earlier literary mention in the *Arthaśāstra*). They appear to derive from the two devices for crushing *soma* juice, *grāvan* and *ulūkhala*. The southern word *chekku* is from the Sanskrit *cakra* or wheel, perhaps by way of the Pali *cakka*.

In the south, the very early term for coconut oil, *nai* (itself originating from Southeast Asia), later became generic for semi-solid fats, such as *vennai* for butter and *nai* for ghee. Both in the north and south, the respective words for sesame oil, *taila* and *ennai*, later became generic for all liquid oils.

INTRODUCTION

Oilseeds have long been known in India, and by inference their oils. A lump of charred sesame seed was found in the ruins of Harappā¹, and a mass of burnt mustard seeds in Chanhudaro², which would date them 2000-1500 BC. The coconut reached the shores of south India through dispersal by sea long before man appeared, and a fossilised coconut has been recovered in Rajasthan from Eocene deposits that could be even 50 million years old³. Both a jewellery piece found in the Indus Valley⁴, and an earthen bowl⁵, seem to be representations of the coconut.

Another ancient source of fat was milk. Fine specimens of milch cattle, one of which can be clearly identified as the Kankrej breed of the present time⁶, are depicted on Indus Valley seals. Clay models of the buffalo suggest that it must have been domesticated, and was possibly a source of milk, as it is now. Bones of a very large number of animals, birds and fish have been found in the Indus Valley; their body fats may have been collected and used in the kitchen, as they certainly were in the same area in later Vedic times. In Mohenjodaro were found several frying pans with handles, identical in shape with those now in use, which strongly suggests that fat was in culinary use for frying.

ISOLATION OF FAT

Cream rises to the top on boiling and cooling milk, and is easily collected. Concussion either of old cream or of curdled milk (brought about simply through movement) to yield butter must have been a very early chance discovery. Animal meat yields fat when cooked with water. Vegetable fats from oilseeds can also be liberated by boiling with water; this practice is even now common for recovering coconut oil from fresh coconut or copra in Kerala, while tribals isolate mahua fat by boiling the kernels.

Somewhere in Indian history was devised a crushing device for oilseeds using human or animal power, and by 500 BC the oilpress is specifically referred to in Sanskrit literature, though never described⁷. The *Arthasātra* of Kautilya, believed to have been written about 300 BC, carries information on oilseed crushing. One of the duties of the Superintendent of the Storehouse was that of supervising the manufacture of rice, oils and the like, termed *siṃhanika*⁸. To quote: "Oil extracted from *atasi* (linseed) will be one-sixth (of the quantity of the seed); that extracted from *nimba*(*neem*, *Azadirachta indica*), *kusamra* (unidentified), and *kapittha*(*Limonia acidissima*) one-fifth; and that extracted from *tila* (sesame), *kusumbha* (safflower), *madhuka* (mahua, *Madhuca indica*) and *ingudi* (*Balanites aegyptiaca*) one-fourth". Some of the indigenous oilseeds in this list yielded edible oils, and other oils that were of medicinal value.

ANCIENT OILSEED CURSHING DEVICES

Devices employed

R̥gveda, dated to c. 1500 BC, describes the *ulūkhala*, a domestic mortar and pestle device used to crush an exhilarating juice from *soma* plant⁹. Also used for the same purpose were grinding stones, or *grāvan*. The sound made during the crushing is poetically compared in the *R̥gveda* to the exertions of bulls and horses¹⁰:

"Like strong draught animals that draw a cart —
Bulls who wear the yoke and are harnessed together —
The stones emit bellows, panting and heaving.
The sound of their snorting is like that of horses".

Later, the *Śātapatha Brāhmaṇa* (c. 800 BC) clearly records the use of "the pestle and mortar, or the two grinding stones" for *soma* crushing¹¹. The *soma* juice thus obtained was ritually offered to the gods, and then imbibed by participants in the ceremony. From a small domestic sacrifice at the start, the *soma* sacrifice seems to have become more elaborate, and in the *Sūtra* literature (800-300 BC), no less than 16 priests are specified for its performance¹². Doubtless, the *ulūkhala* or mortar and its pestle, the *musala* also increased in size

to cater to so many. The origin of the larger oilseed crushing device may be discerned here.

At Dwarka, in Gujarat state, a dozen stone crushing mortars, each about 1.5 metres tall, that were found abandoned in various locations in the area, have recently been assembled together and arranged to flank a pathway in a park. Descriptions affixed to each show the location at which the pieces were found, and describe their use for crushing *soma* juice. However, the design of the mortar and the shape of the internal cavity, with even a drain-hole in the pit in one specimen, make it appear more probable that these are really stone *ghanis* for oilseed crushing. From associated evidence, they are surmised by one authority to date from about the 1st or 2nd century AD¹³. These would certainly be the oldest pressing devices to survive.

Excavations at Aihole in the state of Karnataka have yielded stone *ghanis* of the 6th century AD¹³. A sculptured frieze showing an oilmill in operation is found in the Airateśwara temple (1150-1173 AD) at Darasuram near Kumbakonam in Tamil Nadu. It tells the story of a devotee who regularly crushed oilseeds so as to offer the oil for use in the temple. On one occasion, he could not find raw material, and decided to cut off his head and offer his own blood instead, when Lord Siva intervened to save his devoted disciple¹⁴. A stone oilmill set up in Karnataka state by one Asakka-gavunda, with an inscription to this effect dated 1145 AD, is stated to still exist¹⁵. About the same time, three types of oilmills in the Karnataka area are categorised¹⁶, those driven by oxen (*ettu-gana*), by hand (*kai-gana*) and by foot (*mettu-gana*), the last of which is rather intriguing. An inscription of 1280 AD at Belur in Karnataka records the extraction of coconut oil¹³.

Terms employed

We do not know what the Harappans called the sesame seed. There is some doubt whether the *R̥gveda* reference to *pala* signifies the sesame seed, though the term is used later in compound forms to refer to this oilseed. The *Atharvaveda* repeatedly mentions the use of *tila*, the term employed for sesame in all subsequent literature¹⁷. Sesame oil was *taila*, while *tilaka* signified oil of or from *tila*. To these three words suffixes were attached to denote an oilpress, consisting of the three terms: *peśana* (to grind), *yantra* (machine) and *cakra* (wheel)^{7,18}. Thus, in the later *Bhāviṣya Purāna*, the prefixes *taila-* or *tilaka-* were placed before *peśana-yantra*, or *peśana-cakra* or *yantra-cakra*, or simply before *yantra* or *cakra*, to denote in every instance an oilpress¹⁹.

Subsequent literature sees regular mention of the oilpress and its operator. The *Sūtra* works of 800-300 BC refer to the oilman by such terms as *tailika*, *cakrin* and *cakrika*²⁰. The *Mahābhārata* (400 BC - 400 AD) mentions the *tailika* and the extraction of oil from an oilseed with the help of a machine of some kind^{7,21}, and the *Manusmṛiti* lays down that an oilman is to be considered ritually impure²¹.

Guilds of artisans, termed *śreni*, find frequent mention in Buddhist Jātaka tales after about 400 BC ²², including that of *tilapiśākas*. The earliest epigraphic reference from the 3rd century BC from Nashik, is to a guild of oilmen vowing to provide medicines for monks who fell sick ²³. Another, of about 200 AD, also from Nashik, records an endowment of money invested in three guilds of artisans, including one of *tilapiśākas*²⁴. Two plays of Kalidasa (c. 450 AD), *Raghuvamśa* and *Śākuntala*, mention a famous and wealthy guild of oilmen of Indrapura (Indore) who produced oil from the seeds of *ingudi* (*Balanites aegyptiaca*) to be used for lighting lamps, curing boils and dressing the hair²⁵. All the evidence points to some form of organised pressure grinding of oilseeds, but what shape or form the device took is nowhere made explicit.

GHĀNI EVOLUTION

Oilseed and sugarcane crushing

Oilseed and sugarcane crushing have much in common. In 1885, Grierson²⁶ notes that sugarcane- and oilseed-crushing *kolhus* in Bihar are called by the same name and are almost identical, except that the sugar mill is larger, has a cylindrical pit with parallel sides, and carries no stirrer, as does the oilpress. About the same time, Watt²⁷ also notes the strong resemblance, except for size, between the oilpress and sugarcane press in north and northwest India. In 1836, the administrator Sleeman describes the mortars of the sugarcane mills of Saugor, Rajasthan; these were made of hornblende rock and had a wooden pestle, which is also true of oilmills. The congruity between the two systems is relevant in tracing the origins of the oilseed crushing devices.

Modern names for oilseed processing devices

Ghāni, *kolhu* and *chekku* are the three terms used to denote the oilpress. *Ghāni* is the most common, and there are several variants of pronunciation. The *a* can be long or short and so can the *i*; the *n* can be *n* (𑂔) or *ṇ* (𑂕). The word *ghāni* is used all over north India, and even in the southern states of Karnataka and Andhra Pradesh as *gāna*, *gānuga* and *guruga*. The second term, *kolhu* seems to be in common use in the states of Uttar Pradesh, Bihar, Bengal, Orissa and Madhya Pradesh. In recent times, it also seems to particularly designate the modern rotary metal oilpress used to crush mustard seed.

Both the oilpress and the sugarcane press are referred to as *ghāni* and *kolhu*²⁸. Another parallel is that the word *khali* (also *khali* and *khalli*) is used in Marathi to denote both an oilcake and sugar²⁹. Grinding and size-reduction, with expulsion of a liquid (oil or juice), is, of course, the operation common to both oilseed and sugarcane processing.

The term *ghāni*

Vedic Sanskrit employs the verb *ghāni* to mean to harden, thicken or render compact, and the word *ghana* for a dense material³⁰; so the terms could represent a succinct description of a process by which an oilseed is compacted to cake. The first appearance of the term *ghana* in Sanskrit in relation to oilpressing appears to be in the *Arthaśāstra* of Kautilya, which is frequently credited to c. 300 BC, though several authorities prefer a later date. In this work, cowherds are directed to render oilcakes tasty by adding to them freshly-coagulated milk solids³¹. The word used for oilcakes is *ghānapinyaka*. Yet despite such a lineage, the word *ghāni* was considered a colloquial one and its usage in Sanskrit frowned upon. Thus, commenting on a Sanskrit inscription dated as late as 1264 AD from Varaval in Junagadh, which carries the word *ghāni*, the editor of the inscription haughtily remarks that this is the indigenous word for the *taila-peśana-yantra* of true Sanskrit!³²

Inscriptions constitute indeed the main source of occurrence of words like *ghāni* or *ghana*, or even *ghānaka*, the Sanskritised form. A stone inscription of the 5th/6th century AD from Nadia district of West Bengal uses the term *sarṣapa* (mustard)-*yānaka* to define one boundary of a certain field³³. The second component could be an engraver's error for *ghānaka*, or an error of decipherment, since the Sanskrit letters *ya* (य) and *gha* (घ) are similar. From about 900 AD, though the classical term *tila-peśana-yantra* is the most frequent term for an oilmill, local spoken usage also creeps in. Thus, the twin Siyadoni inscription dated 903 AD and 969 AD found near Gwalior has *ghānaka*, and, a few lines later, *ghrānaka* as well, each term moreover being repeated twice in the inscription³⁴.

Rather unusually, the Gwalior inscription has a hard *ṇ* (ण) in both words. A Bijapur inscription of 997 AD has *ghāna*³⁵, another from Nashik district of 1055 AD has *taila-ghānaka*³⁶, and yet another of 1207 AD from Chitorgarh, near Udaipur, has *ghānaka*³⁷, all with a soft *n* (न). The terms *ghānaka* even occurs in a written Sanskrit work of 1510 AD, the *Ballālacarita* by Ananda Bhat³⁸. Thus, it would appear that perhaps since about 500 BC, the words *ghana* and *ghani* were employed in common speech over a wide area across the north of India. These spoken dialects became the later modern languages of north India, and *ghānaka* seems to have entered the Sanskrit language for its brevity and convenience from spoken usage.

Tracing the origin of the word itself is less easy. Many strands of usage appear to have operated. Classical Hindi, the successor to Sanskrit, both in speech and writing, has *ghāni* meaning to harden, thicken or solidify, and *ghan* for a charge or load or batch of oilseed worked in a press²⁸. Did *ghani* for the device evolve from these, or was it the other way round? Vedic usage has *grāvan* for the stones used to press *soma* juice, and *grāvastut* for the priest who performed the operation³⁹. A stone mortar is even now called *ghavan* in Marathi⁴⁰. The Gujarathi

word for mill is *ghatani*, and *ghatanika* means pounding⁴⁰. This could be related to the identical word, *ghatanika*, meaning club or mace, found both in the *Rāmāyana* and the *Matsya Purāṇa*⁴¹. Turner in his dictionary of Indo-Aryan languages has actually suggested that *ghani* is a composite of *ghāna*, an ordinary mill, and the Vedic stone *grāvan*, though he also remarks that the derivation is unsatisfactory⁴². The word *ghāni* appears to be a result of complex associations in the past between words and actions connected with grinding and pounding, which constitute the operation.

The word kolhu

Like *ghāni*, *kolhu* also appears to be a spoken word that entered Sanskrit as *kolhuka*. Only one early usage of the word could be traced in epigraphs. The copperplate inscriptions of 933 AD of the Vaillabhatasvamin temple in Gwalior record certain pledges made by citizens, which include one by a guild of oilmen, to supply one *palika* of oil from each oilmill on the ninth day of the bright half of every lunar month⁴³. A very archaic form of Sanskrit is stated to be employed in the 27 verses making up the inscription, in which *kolhuka* is used for the oilmill.

Again, one can only speculate on the diverse threads that may have gone into its etymology. The *R̥gveda* has *ulūkhala* for the mortar used to crush *soma* juice, from which was derived *ulukhalika* for the act of crushing or grinding. Even as early as 750 AD, the term *khali* is found being employed for both oilcake and sugar²⁷ (as it still is). From the early Sanskrit term *iksu* for sugarcane seem to have stemmed several words in later use, such as *ikh* and *ukh* for the cane, *ukar* for a pot or vessel for husking grain, and *ikhli* or *okhli* for a small mortar⁴⁴. Even the pestle alone has come to be called *okhli*. Classical Hindi has *kutara* or *kutaru* for the post around which the millstone moves during crushing, and *kalkaja* or *kalka* for oilcake⁴⁵. The Hindi term now in use for the mortar of the *ghani* is *aukhali*. From the grinding mortar *ulūkhala* of early Vedic times to the shorter *khali* and *kolhu* is not a far cry, with associations also thrown in from sugarcane crushing, with which oilseed crushing has a close relationship.

The expression chekku of south India

Tailika-yantra-cakra, literally translated, is oilmill-wheel. In the *Bhāviṣya Purāṇa* of c. 500 AD it is first employed to denote a wheel, and later (perhaps by the familiar device of denoting the whole by a part) for the entire oilmill as well⁷. Both the oilman, and the potter, were termed *cakrin*. The potter, of course, turned his wheel; did the oilman also provide human traction by walking round in a circle, or did he sit on the beam (as is still common) to be carried round in a circle by the animal?

To return to etymology, in the Pali *cakra* becomes *cakka*; it denotes any wheel, pulley, millstone or mill, and the current Hindi word *chakki* has all these connotations. In south India, the form is *chekku* (or *sekku*), which first occurs in

Tamil literature in the work *Nāladīyar*⁴⁶ dated to the 7th century AD and again about a century later in the *Nalāyira Thivya Prabantham*⁴⁷. There is a considerably earlier reference in the *Puranānūru* of the 2nd/3rd century AD to the froth or foam (*nurai*) on the surface of the oil extracted from sesame seed⁴⁸. This foam is a characteristic feature when wetted sesame seed is extracted in a mortar and pestle device, and does suggest that such a method of oil expelling was in use in south India by that time.

Cekku thus appears to be Sanskrit-derived, and so are other Tamil words for the oilmill, like *yantiram* and *yentiram* (both from Sanskrit *yantra* or machine), while *thirikaiyattam* is Tamil for turning-hand-action⁴⁹. There are later and less-common terms like *ālai* and *utrumaram* (both derived from Tamil words for a log of wood), which are obviously of local origin⁴⁹. It would seem that the crushing device came into south India from the north along with its names following the Aryan acculturation starting about the 6th/5th century BC.

NAMES FOR OILS

North India

We do not know what generic names the Harappans employed for liquid oils and solid fats, nor, of course, for individual entities within them. In Sanskrit, sesame or *tila* was the oilseed *par excellence*; its oil was *taila*, which went on to become the generic word for all vegetable oils, and is still in use in Hindi as *tel*. Ghee or milkfat was *ghṛta*, and semi-solid or solid animal body fats were *vasa* or *medasa*, with qualifications to indicate source.

South India

Rather strangely, in Tamil also the specific name for sesame oil eventually became a generic one for all liquid oils. The evolution was more complex than in the north. The name for sesame in the oldest Tamil work that has survived, a grammar called *Tholkappiyam* written about the start of Christian era, is *eṇṇ*⁵⁰. Quite soon thereafter the term *eṇṇai* is applied to sesame oil in the *Puranānūru*⁵¹, which refers to the sesame seed by the term *eḷḷu* by which it is still known. Incidentally, the resemblance between the very old term *eḷḷu* and the Greek *elaion* meaning olive oil, is rather striking⁵². Later, the Tamil word *eṇṇai* for sesame oil became the generic term for all oils, with a prefix to denote origin, like *eḷḷu-eṇṇai* for sesame oil and *thenga-eṇṇai* for coconut oil.

The coconut came to south India in prehistoric times from Polynesia. The word for coconut oil is *ngai* in the Nicobar Islands, *niu* in Polynesia and *niyor* in Malaysia, and it is surmised that the Tamil word *nai* is derived from these⁵³. Later, this word came to connote a semi-solid fat, like coconut oil itself, or butter (*veṇṇai*, white fat) or ghee (simply *naṅ*). This would imply that coconut oil was the first of its genre in south India, which is hardly surprising since its abundant

presence in coconut meat is only too apparent in culinary use. Thus, linguistic evidence supports the archaeological and botanical regarding the very early entry of the coconut into south India. When eventually oil came to be drawn by crushing from the sesame or *enn*, it would have been natural to term it *enn-nai*. Arrival with the Aryans of a mechanical pressing device for the crushing of oilseeds would have led soon enough to the milling of copra as well for its oil.

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