

The linguistic history of some Indian domestic plants*

From the mist of times emerge our earliest Indian texts, the Rgveda (c. 1300–1000 BCE), composed in the Northwest of the subcontinent, and the Sangam texts (c. 2nd cent. BCE – early CE), composed in the extreme South. They contain valuable materials in archaic Indo-Aryan (Vedic Sanskrit) and in archaic Old Tamil respectively. The former belongs, along with Old Iranian (Avestan of Zarathustra), to the ancient Indo-Iranian subfamily of Indo-European that stretches from Iceland to Assam and Sri Lanka (Beekes 1995; Szemerényi 1996; for material archaeology, see Mallory and Adams 1997). The latter belongs to the Dravidian family (Krishnamurti 2003), that is restricted to the subcontinent but may have relatives in Northern Asia (Uralic) and beyond. (Such as the proposed Nostratic superfamily that includes Indo-European (IE), Dravidian, Uralic, Altaic, Afroasiatic and Kartvelian (Georgian). For Nostratic dictionaries, see <http://starling.rinet.ru/main.html>.)

As for the plant names found in these old sources, it must be observed that recent advances in archaeobotany (Fuller 2006a,b, 2009a,b) indicate at least three major nuclei of food production in the subcontinent. They can be briefly characterized as follows.

In the west of the subcontinent, the food producing package was derived from that of the Middle East: winter wheat, goat/sheep, with the Indian addition of the Zebu and water buffalo. Wheat even has a Near Eastern name and it is not the result of local domestication as was sometimes thought; instead it took some 2000 years in the western border regions of Pakistan and Afghanistan before it was acclimatized to Indian climatic conditions (Fuller 2006a,b, 2009a,b).

Second, there was a Lower Gangetic agricultural centre with rice and water buffalo (c. 2500 BCE). Agriculture was first established only around 3000 BCE, in spite of what is now sometimes claimed by some archaeologists (Tewari *et al.* 2009, however, see discussion by D Q Fuller @ Archaeobotanist.blogspot.com/indian-archaeology-watch-lahuradewa.html). Indian rice (*vṛīhi*, *Oryza indica*) is a hybrid of northern Indian wild rice, *O. nivāra*, and the southern Chinese domesticated variety, *O. japonica* (as recent genetic research has indicated (Sato 2004, 2006a,b).

Third, there is a somewhat later upper South Indian center with intensive cattle herding and growing of millets, including an African variety. Around 1800 BCE, it spread southward and also northward into Malwa.

Fourth, there may have been additional indigenous centres of food production, one in the east (Orissa/Jharkhand), and one in the west (W. Gujarat, S. Rajasthan) (Fuller 2006a,b, 2009a,b).

Both the earliest Indo-Aryan (often still, but erroneously called “Aryan”) (The ancient Iranians [like King Darius, 519 BCE] also called themselves *ariya/driia*) and Old Tamil texts contain names of trees, plants and agricultural products that shed considerable light on the early history of plants in the subcontinent and of the people who used them. In addition, the testimony of later texts and languages, down to those still contained but hidden in modern ones, will be used.

In this investigation, only some of the most important plant terms can be dealt with, especially those for barley, oats, millet, wheat, and rice, – some of which have diverse, sometimes surprising origins in all the major 5 linguistic families of the subcontinent and well beyond.

The largest of them, Indo-European, is represented in the subcontinent by the great Indo-Iranian subfamily that includes Iranian, Nuristani (Kafiri in northeast Afghanistan) and Indo-Aryan (“Aryan”). East of Nuristani, there is the Indo-Aryan (IA) subfamily of Dardic which exhibits most of the

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developments seen in the rest of the Indo-Aryan languages. Dardic includes the languages spoken from the borders of Afghanistan to the eastern Kisthwar dialect of Kashmiri, among others: Kalasha, Khovar, Shina, Kohistani, and Kashmiri.

Dravidian covers all of the south and some parts of Central India as well as the North Dravidian outliers Brahui in Baluchistan, Kurukh in N. Madhya Pradesh, and Malto in S.E. Bihar. The latter three have moved out of Central India into their current homelands only around 1000 CE (Elfenbein 1987).

Besides the Indo-European and Dravidian families, there also is the Austroasiatic one, represented in India by the Munda languages (Anderson 2008) of central and eastern India, by Khasi in the hills of Meghalaya and by Nicobarese. Another family is Tibeto-Burmese, spoken all over the northern sections of the Himalayan belt including Arunachal Pradesh and in the eastern states of Nagaland, Assam, Meghalaya, Manipur, Mizoram and Tripura. A fifth family is represented by Burushaski (Berger 1998), a remnant language in Hunza (northernmost Pakistan), and finally there is Andamanese. To this, we can add substantial evidence for remnants of lost families (see below).

As for Indo-Aryan, the diverse origin of names for agricultural plants is not really surprising because of the predominantly pastoral interests of the early speakers of Vedic. Differently from the frequently met with IE/IA terms for cattle, milk, horse, etc., agricultural ones such as ‘barley’, ‘ploughing’, etc. are significantly less frequent. Consequently, the multitude of Indo-Aryan words for plants that have come down to us stem from the other language families present then and especially so, from the now lost substrate languages. Linguistic investigation indicates that they covered large stretches of the subcontinent (Witzel M 1999; cf. <http://ejvs.laurasianacademy.com/issues.html>).

Such local (substrate) words can be isolated from Indo-Aryan fairly easily by linguistic observations. They have unusual sounds and word structure, and there usually is a lack of a convincing Indo-European etymology tracing back the word to cognates in other IE languages. For example, in Vedic Sanskrit a word like *busa* ‘drizzle, chaff’ is actually not allowed: it should have been *buṣa* with a retroflex ṣ (as in *Kṛṣṇa* or *bhāṣā*). Indeed, the word is found in the non-IE Burushaski language as *buṣa* (and in neighboring Iranian languages). (And, as loans in E. Iranian: *Sariqoli bus* and *Waxi bis*, cf. also Munda: *Santali busu’b*, see Pinnow 1959: 93 § 120; cf. *EWA* II 229 sq.; for a possible Munda origin [cf. *Sadani bhusū*] see Osada, *IJJ* 38, 1995.)

Many such words stick out immediately like the proverbial sore thumb, just as words with initial *ng-*, *nk-* or *mf-* would do in English (*Nkrumah*, *Zulu nkosi* ‘god’, Mfume now an American surname). The same applies to word structure. A Ṛgvedic name like *Balbūtha* cannot be parsed according to Vedic or Indo-European rules: there is no IE/IA root word *balb-* and no suffix *ūtha*. The word goes back to an unknown, lost language of the Greater Panjab, about which more below. Unfortunately, scholarship has not advanced that far in the analysis of Proto-Dravidian, and even less so in Munda, etc.

Now, as for the names of these domestic plants and agricultural terms, some important aspects of their early history in the subcontinent can be gleaned from the oldest, strictly transmitted oral texts, the Vedas (c. 1300–1000 BCE) (for the Vedas and their strict oral transmission, see Witzel M 1997, <http://www.people.fas.harvard.edu/~witzel/canon.pdf>) down to the records of early historical times. (Texts before the first historical documents Aśoka’s inscriptions, c. 250 BCE), include the Buddhist canon in Pāli collected c. 250 CE under Aśoka, Pāṇini’s grammar and early commentaries of it [c. 350–150 BCE], the Indian epics (*Mahābhārata*, *Rāmāyaṇa* [c. 100 BCE]), and a few texts such as the early parts of Kaṭilya’s *Arthaśāstra*.) Many of the agricultural terms found in the Vedas have survived until today, like *yava* ‘barley’ as Hindi *jau*.

As for Indo-Aryan, the early evidence can be counterchecked and expanded by attestations in medieval (MIA) and modern (NIA) Indian languages. This is especially useful when studying words that have been ignored in the religious and ritualistic Vedas but that are available in Middle or New Indo-Aryan languages, such as the Buddhist Pāli texts, the various Prakṛts or modern languages like Hindi, etc., as compiled in R L Turner’s *Comparative Dictionary of Indo-Aryan languages (CDIAL)*. For example, the old agricultural word for ‘flour’ turns up only in some of the modern Indo-Aryan languages, such as *āṭā* ‘flour’ in Hindi, etc. It goes back to the non-attested Vedic Sanskrit **ārta* ‘flour’, CDIAK 1338, from *ṛt* ‘to grind.’ (Turner, CDIAL 1338 with discussion, **ārta* ‘flour’, *aṭṭa* ‘food’ MBh., ‘boiled rice’ lex; Gāndhārī: *Niya* Doc.s; Gy. eur. *aro*, *varo*, *vanro*, etc. ; Dardic: *ōt*, *āt*, *aṭ* etc. K. abl. *āt*; S. *aṭo* ‘meal’, L. *āṭā* ‘flour’, P. *āṭṭā*, etc., N. *āṭo*, *āṭo*, A. B. *āṭā*, etc., H. *āṭā*, G. *aṭo*; M. ‘grit of rice boiled and mixed with flour.’)

The current investigation also includes the detailed study of agricultural terms (and their sources) in Hindi by Masica (1979) and its use by Fuller (2006a, b; appendix), whose discussion fortunately includes their respective area of origin. For IA, we have the etymological dictionary of Sanskrit by Mayrhofer (1986–2000) and Turner's *CDIAL* (Turner 1966). For Dravidian there is the etymological dictionary by Burrow and Emeneau (1984) – actually just an extensive list of related words – and the recent reconstruction of Proto-Dravidian by Bh. Krishnamurti (2003). The situation is much worse for Munda (David Stampe, online dict.: <http://ling.ill.hawaii.edu/austroasiatic>), Burushaski (Berger 1998), and Tibeto-Burmese (Benedict 1972).

One constant problem to be taken into account is that (a) the exact botanical identification of certain plants (especially of the various sorts of millet/sorghum) is not always reliable and (b) that an older designation of a cereal plant may be used for a newly introduced one, as is especially frequent with millets, but which also occurs across species boundaries such as between barley and rice.

To indicate how people felt around 1000–500 BCE, luckily we have some Middle Vedic texts, composed in North India, which name seven or ten important domestic plants (*saptā grāmyā ośadhayah*). The 7 plants are: rice, barley, sesame, mung beans, millets, wheat, lentil, other beans, and the pulse *Dolichos biflor* (Taittirīya Samhitā 5.2.5.5, Śatapatha Brāhmaṇa 14.9.3.22.), and the 10 are: vrīhī rice, *Oryza sativa*; yāva barley, *Hordeum vulgare*; tila sesame, *Sesamum indicum*; māṣa mung beans, *Phaseolus mungo*; āṇu millet, *Panicum miliaceum*; priyāngu millet, *Setaria italica* (L.), *Panicum italicum*; godhūma wheat, *Triticum aestivum/sativum*; masūra lentil, *Lens culinaris*; khālva beans, *Phaseolus radiatus*, a variety of *Phaseolus mungo* = māṣa(?); *khalā-kula Dolichos biflorus* L. (Rau 1997). These Vedic lists begin with the food most favourable to the gods (and humans), rice and barley.

In the appendix (see supplementary material), plants and their names are ordered according to their geographical origin, their first attestation in texts as well as the place of the texts' composition, so that a fairly detailed picture emerges for the ultimate 'origin' and the first textual attestation in time (Witzel 1997, 2006) and space (Witzel 1987) of Indian plants.

Likewise, these data are presented (see supplementary material) in roughly historical and geographical order, starting in the northwest and west of the subcontinent with our oldest testimony.

To summarise the thesis presented in this paper, we can detect several ancient centers of food production in India: the west (Indus civilization, including Haryana and W. Gujarat), the Gangetic plains and the South, each one with its own peculiar package of plants and domestic animals. The linguistic data, gleaned for the most ancient texts (Veda, Sangam) agree with this scenario. They actually further improve and refine the picture, as they allow us to go well beyond the ancient texts and access the earlier periods preceding them.

Behind the Late Bronze Age data of the R̥gveda we can thus detect an ancient population that already possessed its own indigenous agricultural terms. We can connect this substrate with the preceding agricultural communities of the Indus Civilization (2600–1900), and even with its predecessors (c. 6000–2600 BCE), both of which had adopted the typical W. Asian wheat/cattle/caprid package.

The same procedure applies to the Gangetic plains as depicted in the later Vedic texts (c. 1000–500 BCE), and as still indicated by modern IA languages such as Hindi. An earlier Gangetic substrate emerges that has peculiar agricultural terms corresponding to its specialized rice/buffalo package (c. 3000/2500 BCE).

The case for the South is again similar: the Dravidian languages indicate a southern package of food production (millet/cattle), especially when making use of reconstructed Proto-Dravidian. This early form differs considerably from the data of the later, iron-age stage of the southernmost languages (Tamil-Malayalam), with developed millet/rice agriculture and saw emerging state formation.

Much of the relevant data are still obscured by the evidence hidden in the little studied substrates of the IA, Dravidian and Munda languages. Much more work by linguists has to be done to see progress in the evaluation of the culture of these early periods. For a beginning, one may consult the online substrate dictionary (in progress), SARVA.

Second, many details need to be elucidated through close cooperation between linguists and archaeobotanists. Unfortunately, strict procedures in dealing with flora (and fauna) in archaeological excavations in the subcontinent have been employed only fairly recently, and earlier reports cannot be trusted with regard to the (scanty) collections and identifications of plant and animal remains. We need substantive and representative *regional* collections for comparisons (Meadow 1998; Meadow and Patel 2003) in order to achieve substantial progress.

Remembering such great early summaries as the 17th century *Hortus Malabaricus* for Kerala, or the – still useful ones – such as Brandis' on Indian trees (Reede tot Drakestein 2003; Brandis 1906), we also have to compare other early textual materials. Much is still hidden in the largely unpublished and untranslated texts on Vṛkṣa Āyurveda, which actually deal not just with trees but also with agriculture in general. This includes, for example, such unexpected methods as fertilization of trees by fish residue. Some of these Ayurveda texts contain elaborate pictures of the plants described. I have seen one such beautifully illustrated book in private possession (Ayurveda Society of Naradevi, Kathmandu) that had detailed descriptions in a multitude of Indian languages and have once come across a collation of agricultural data of many hundreds of Sanskrit pages, made for the Union Government, already in 1979. There is also illustrated manuscript of the Kitab al-Hashaish, in the Khuda Baksh Oriental Public Library, Patna, no. HL 2189, see: Vijnānavidhi. Manuscript Treasures of India. New Delhi: National Mission for Manuscripts 2007: 62 (in Arabic, and occasionally, in Greek).

Third, we urgently need regional surveys of smaller languages and dialects, especially of remnant languages like Kusunda, Tharu, Bhili, Nihali, Toda (and also of Andamanese, Shompen, Vedda) as to gain a clearer picture of the early stages of food production in India, – especially for areas that do not have old literatures (such as Central India). This has then to be expanded by the study of substrate words in the literary languages and in the extant vocabularies of *all* Indian languages – a task barely begun outside IA. Otherwise, we remain boxed in, for our earliest data, between those from the extreme Northwest (Rgveda) and the extreme South (Sangam), at 1000 and 200 BCE respectively, and have to extrapolate for the rest of the subcontinent.

I conclude, therefore, with an appeal to botanists (and zoologists) (not treated here, but similarly promising) to join forces with archaeologists, geneticists, linguists and textual scholars to exchange data and discuss them in collaborative fashion. (Such as at our yearly Harvard Round Tables: <http://www.people.fas.harvard.edu/~witzel/ROUND%20TABLES-2007.htm> and later ones (2008–2009) at the same website.) See however, already the paper, 40 years ago, 1967–68, by Vishnu Mittre, which is characterized as: “Vishnu Mittre looks into dating mechanism, environmental archaeology, and palaeontology in relation to archaeology and recommends a closer collaboration”. Only then real progress will be possible.

References

- Anderson G D S (ed.) 2008 *The Munda languages* (London, New York: Routledge)
- Beekes R S P 1995 *Comparative Indo-European linguistics: an introduction*, (Amsterdam/Philadelphia: J. Benjamins Publication)
- Benedict P K 1972 *Sino-Tibetan. A conspectus* (Cambridge)
- Berger H 1988 *Die Burushaski-Sprache von Hunza und Nager* (Wiesbaden: Harrassowitz)
- Brandis D 1906 *Indian trees: an account of trees, shrubs, woody climbers, bamboos, and palms indigenous or commonly cultivated in the British Indian Empire*; assisted by Indian foresters (London: A Constable & co., Ltd.)
- Burrow T and Emeneau M B 1984 *A Dravidian Etymological Dictionary* Second Edition. (Oxford: Clarendon Press)
- Elfenbein J H 1987 A periploous of the ‘Brahui problem’; *Studia Iranica* **16** 215–233
- Fuller D Q 2006a Silence before sedentism and the advent of cash-crops. A status report on early agriculture in South Asia from plant domestication to the development of political economies (with an excursus on the problem of semantic shift among millets and rice); in *Proceedings of the Pre-Symposium of RHIN and 7th ESCA Harvard-Kyoto Round Table*. (ed.) T Osada (Kyoto: Research Institute for Humanity and Nature (RHIN)) pp 175–213
- Fuller D Q 2006b Agricultural origins and frontiers in South Asia: a working hypothesis; *J. World Prehistory* **20** 1–86
- Fuller D Q 2009a Framing a Middle Asian corridor of crops exchange and agricultural innovation; in *13th Harvard University Round Table. Ethnogenesis of South and Central Asia (ESCA), Kyoto session* (Kyoto: Research Institute for Humanity and Nature (RHIN)) pp 3–11
- Fuller D Q 2009b The Archaeobotanist (<http://Archaeobotanist.blogspot.com/indian-archaeology-watch-lahura-dewa.html>)
- Krishnamurti Bh 2003 *The Dravidian Languages* (Cambridge: Cambridge University Press)
- Mallory J P and Adams D Q 1997 *Encyclopedia of Indo-European culture* (London, Chicago: Fitzroy Dearborn)
- Masica C P 1979 Aryan and Non-Aryan Elements in North Indian Agriculture; in *Aryan and Non-Aryan in India* (eds) M M Deshpande and P E Hook (Ann Arbor : Center for South and Southeast Asian Studies) pp 55–151

- Mayrhofer M 1986-2000 *Etymologisches Wörterbuch des Altindiarischen*. Vol. I–IV (Heidelberg: Winter)
- Meadow R H 1998 Pre- and proto-historic agricultural and pastoral transformations in northwestern South Asia; *Rev. Archaeol. Transition Agric. Old World* (Special Issue ed. by Ofer Bar-Yosef) **19** 12–21
- Meadow R H and Ajita K 2003 Patel. Prehistoric pastoralism in northwestern South Asia from the Neolithic through the Harappan period. Chapter 3; in *Indus Ethnobiology: New Perspectives from the Field*. (eds) Steven A Weber and William R Belcher (Latham, MD: Lexington Books) pp 65–93
- Rau W 1997 The earliest literary evidence for permanent Vedic settlements; in *Inside the Texts, Beyond the Texts. New Approaches to the Study of the Vedas*. (ed.) M Witzel (Harvard Oriental Series. Opera Minora, Cambridge) vol. 2, pp 202–206
- Reede tot Drakestein 2003 Hendrik van. *Hortus malabaricus* (English version: *Malabar Garden with annotations and modern botanical nomenclature* by K S Manilal, Thiruvananthapuram : University of Kerala)
- Sato Y-I 2006a *Rice and the Indus Civilization*; in *Proceedings of the Pre-Symposium of RHIN and 7th ESCA Harvard-Kyoto Round Table*. (ed.) T Osada (Kyoto: Published by the Research Institute for Humanity and Nature (RHIN)) pp 213–214
- Sato Y-I 2006b Of crops: what is common and what is different? – Fudo and agriculture; in *Proceedings of the Pre-Symposium of RHIN and 7th ESCA Harvard-Kyoto Round Table*. (ed.) T Osada (Kyoto: Published by the Research Institute for Humanity and Nature (RHIN)) pp 73–78
- Szemerényi O 1996 *Introduction to Indo-European linguistics* (Oxford: Clarendon Press/New York: Oxford University Press)
- Turner R L 1966 *A comparative Dictionary of the Indo-Aryan Languages* (London)
- Witzel M (ed.) 1997 The Development of the Vedic Canon and its Schools: The Social and Political Milieu; in *Inside the texts, beyond the texts. New approaches to the study of the Vedas* (Harvard Oriental Series. Opera Minora, Cambridge) vol. 2, pp257-345. <http://www.people.fas.harvard.edu/~witzel/canon.pdf>.
- Witzel M 2006 South Asian agricultural vocabulary; in *Proceedings of the Pre-Symposium of RHIN and 7th ESCA Harvard-Kyoto Round Table*. (ed.) T Osada (Kyoto: Research Institute for Humanity and Nature (RHIN)) pp 96–120

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