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The origin and dispersal of millet cultivation in India

Millet is a group name of cereals known as coarse grains. They comprise plants belonging to different genera and species with widely varying habits and characters. Millets are warm-weather cereals with small grains and include six genera, i.e. *Panicum miliaceum* - Indian millet (Chesna, Sawan) and *Panicum miliare* - Little fox - tailed millet, *Echinochloa* - Barnyard millet, *Pennisetum typhoies* - Pearl millet, *Paspalum scrobiculatum* L. - Kodo millet, *Eleusine coracana* - *Ragi* (African millet), *Sorghum vulgare* - Great millet (Jowar).

Archaeobotanical studies of plant and grain remains obtained from archaeological sites during the past two decades have resulted in an almost continuous history of millet cultivation in India. Various types of millets have been reported from the pre-Harappan culture at Rohira, the Late Harappan culture at Hulas in western Uttar Pradesh, in the same context at several sites in Guarajat (Rangpur, Surkodta, Rojdi) and in the Neolithic levels at Hallur (Karnataka), besides Pirak in Pakistan. These grains were grown in the Chalcolitihic culture at Ahar (south-eastern Rajasthan) and at Paunar in northern Maharasthra. The evidence from these sites is as follows:

Evidence for the cultivation of jowar millet (*Sorghum vulgare* L.) at Rohira has been obtained from Period IA (pre-Harappan, ca. 2300-2000 B.C.) along with that of barley, wheat, lentil and horse gram (IAR, 1983-84:188).

The Late Harappan crops at Hulas (district Saharanpur) comprised barley and several varieties of wheat and pulses. A single subglobos seed with vaguely rugose ornamentation was provisionally identified as ragi (*Eleusine coracana*) (IAR, 1982-83:149).

The Late Harappan sites of Guajarat-Surkotda, Rangpur and Rojdi have furnished evidence in recent years of millet cultivation. At Surkotda two lumps of charred masses have yielded as many as 574 carbonized seeds, an overwhelming majority of which are of wild plant species. Of these, 40 seeds, earlier referred to ragi (*Eleusine coracana*) were found to belong to that of *Setaria* spp. (Vishnu Mittra & R. Savithri 1982:214). Further research on this charred mass confirmed the occurrence of *Eleusine coracana* and *Setaria italica* (IAR 1974-75:78). The

later grain is of considerable interest as it has been discovered for the first time in such an early context.

The plant remains from Rangpur were identified as rice husk (*Oryza sp.*) and charred remains of bajra or pearl millet (*Pennisetum*). Along with other cereals, Rojdi has yielded evidence of two large millets i.e., *Sorghum bicolor* and *Pennisetum typhoideum* (Possehl 1986: 195-236). The type site of Banas culture in south-eastern Rajasthan is Ahar. Evidence for the cultivation of pearl millet (*Pennisetum typhoideum*) and jowar (*Sorghum vulgare* L.) have been obtained from Period I. However, there is some controversy regarding the stratigraphic position of these samples as these came from a disturbed area (Vishnu Mittre 1969).

A large number of Jorwe culture sites have been found from various parts of Maharashtra (Deccan) except the Konkan. Of these, Inamgaon and Diamabad have provided evidence regarding agricultural practices of these people. Jowar (*Sorghum vulgare*) was introduced at Inamgaon after the end of the early Jorwe period (IAR, 1972-73: 68). Grains of kondo millet (*Paspalum scrobiculatun* Linn.) and finger millet (*Eleusine coracana* Linn.) have also been reported from this site (IAR, 1977-78: 92). Evidence for the cultivation of ragi (*Eleusine coracana*) comes at Diamabad from the Malwa and Jorwa culture levels. In the Jorwa levels grain of Ragi (*Eleusine coracana*), Kodon millet (*Paspalum scrobiculatum* Linn.) and foxtail millet (*Setaria italica* L.) were found (Vishnu Mittre et al. 1986: 588-623).

Among the Neolithic cultures of South India two sites located in Karnataka have furnished evidence of cultivation of millet. These are Hallur and Tekkakota. The earliest report of a millet in India is the presence of *Eleusine coracana* at the former site dating to approximately 2300 B.C. (Vishnu Mittre 1971). In the recent excavations of Oriyo Timbo in the Shavnager district of Gujarat state, 77% of seeds were found to be millets comprising *Panicum, Setaria* spp. (foxtail millet) and *Eleusine coracana* (finger millet or ragi). The site has been dated to the first half of second millennium B.C. and the excavators believe that it was a seasonal encampment occupied every year during the months of March to July.

Diffusion of millet cultivation

Ragi or Finger millet *Eleusina coracana* is originally an African millet and was transported to India in the pre-Aryan times (Mehra 1963). In a recent study Harlan (1971) thinks that the area of probable domestication of *Eleusine coracana* was in the highlands from Ethiopia to Uganda; for *Sorghum bicolor* in a wide zone in the broad leaved savannah belt that stretches from lake Chad to eastern central Sudan (evidence from Kadero). He thinks that pearl millet (*Pennisetum americanum*) was domesticated in the dry savannah from Sudan to Senegal (Harlan 1971: 471). It will be interesting to enquire whether this millet reached Indian penninsula by land or by some other route, perhaps sea, particu-

larly in the light of the evidence of the headrests which suggest probable contacts with Egypt (Nagaraja Rao 1970: 141-148). Their integration into the Indian subsistence seems to have taken place towards the closing centuries of the third millennium B.C. Once in India, its cultivation caught up in the southern millet region comprising the Jhansi division in southern Uttar Pradesh, central Madhya Pradesh, western Andhra Pradesh, western Tamil Nadu, eastern Maharashtra and parts of Karnataka. The rainfall in this region is 50 to 100 millimeters and the soil is partly black cotton and partly lateritic. This country exported this cereal to other lands in the early historical times. We are told that the Romans sought an Indian millet grown in Pliny's days (first century A.D.) which had a huge yield capacity produced approximately 1,65 liters of grain (Sidebotham 1986: 21). Today the millets form an essential item in the dietary system of the poorer sections of the society and are a valuable source of fodder to the cattle.

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