Wheat Domestication: Archaeobotanical Evidence

Genetic evidence of Manfred Heun et al. (Reports, 14 Nov. p. 1312) for einkorn wheat domestication in southeast Turkey has been countered by Martin K. Jones et al. (Letters, 16 Jan., p. 302). Jones et al. cite evidence that agriculture began earlier in the southern Levant and that einkorn was one of the original domesticates there. Recent archaeobotanical work does not support the picture presented by Jones et al.

Archaeological plant remains from four pre-pottery Neolithic A (1) sites are said by Jones et al. to indicate domestication of einkorn, emmer, and barley in the southern Levant at about 8000 to 7700 years B.C. (radiocarbon-dated). Einkorn is absent from all four sites and from the earlier site of Ohalo II (17,000 B.C.) in the same region (2). There is no evidence for domesticated plants in the PPNA levels of Jericho, Netiv Hagdud, and Gilgal (3). The earliest level (IA) at Aswad (7800 to 7600 B.C.) contains emmer and barley that may be domesticated (4). Domesticated einkorn does not appear in the region until the PPNB, at Jericho (7300 B.C.) and level II at Aswad (6900 B.C.).

In contrast, both wild and domesticated einkorn and emmer are present at early agricultural sites in the northern Fertile Crescent of southwest Turkey and northern Syria dating from 7700 to 7500 B.C. (5). Wild einkorn is also present in pre-agricultural levels of sites in this region, including Mureybit (8500 B.C.) (6), phase 1 of Abu Hureyra (9500 to 8000 B.C.) (7), Dja’dde (9600 B.C.), and Jerf al Ahmar (9800 B.C.) (8). This fits well with the current-day distribution of wild einkorn, abundant in the northern Fertile Crescent, but virtually absent from the southern Levant (9). Study of seeds and charcoal from early Holocene sites in southwest Asia confirms that vegetation at this period was similar to current-day potential vegetation (10).

In view of the small number of excavated sites and the large error limits associated with Neolithic radiocarbon dates, current archaeobotanical evidence does not allow localization of agricultural origins to any one subregion within the fertile crescent. However, the genetic evidence for domestication of one crop, einkorn, in southeast Turkey agrees well with archaeobotanical evidence. Whether other crops were domesticated in the same part of the Fertile Crescent remains to be established.

Mark Nesbitt
Delwen Samuel
Institute of Archaeology,
University College London,
London WC1H 0PY, United Kingdom
E-mail: d samuel @ucl.ac.uk

References and Notes

1. The earliest Neolithic of southwest Asia is divided into the PPNA (6300 to 7500 B.C.) and the PPNB (7600 to 6200 B.C.) periods.
5. Domesticated einkorn, emmer, and barley are reported from Caler Hoyuk at 7500 BC (D. de Moulins, Cah. Euphrate 7, 191 (1953)) and from Abu Hureyra at 7700 B.C. (phase 2A) (D. de Moulins, Agricultural Changes at Euphrates and Steppe Sites in the Mid-8th to the 6th Millennium B.C. (British Archaeological Reports, Int. Ser. 683. Oxford, 1997)).

Correction: Note that the Dja’dde and Jerf al Ahmar radiocarbon dates are mistakenly given as B.P. dates. The dates are in fact 7650 B.C. and 7850 B.C.