Cereal Chaff & Wheat Evolution

Wheat evolution has been complex, involving hybridizations and selection for processing traits (hulled versus free-threshing). Archaeologically much of this evolution can be traced through the remains of chaff. It is also important to be able to distinguish barley and rye chaff from that of wheat. Some other cereals and grasses may also be preserved as chaff but have received less attention from archaeobotanists.
spikelet forks/ glume bases = glume wheat

rachis segments, multiple or single = free-threshing by-product of wheat, rye or barley

basic: narrow tops: probably subsp. distichon (2-row)

more flared, distinct lateral bases: 6-row or 4-row

"simple" segments: straight sides, slightly flared top, straight profile

Hordeum vulgare

recurred, flared top of segments: free-threshing wheats

Secale cereale

polonicum
"robust, long" east Europe
Caucasus/ Armenia
rare variant tetraploids

carthlicum
"strechted, thin"

hexaploid (aestivum sensu lato)
** thin section, sharp edge,
distinct grooves
* shield-shaped
* no bulges or glume bases
"waist & no breasts"

tetraploid (durum sensu lato)
** rounded section, edge thick,
no grooves (but ribbing/
wrinkling on immature)
** bulges, sometimes glume bases
* staight-edged, rarely
shield-shaped
"breasts & no waist"
Glume bases of glume wheats

**dicoccum**
- emmer: trapezoidal cross-section, keel protrudes to side; a few striations,
- fork: short, wide scar; wide angle between glumes

**monococcum**
- einkorn: square cross-section, keel protrudes forward
- fork: narrow long scar
- glumes usually with narrow angle

**“new” striate emmeroid:**
- like emmer but ridged, keel protrudes forward
- *timopheevi* is similar

**spelta**
- curved, heavily ridged
- no clear keel

**Aegilops**
- semi-circular, thick, heavily ribbed

**some other chaff**

**Oryza** spikelet base

- like rye or barley, but very small and thin: various wild grasses such as *Lolium, Bromus*

**Pennisetum** involucre base (with bristle bases)

**Sorghum** rachis/ spikelet base

**Setaria** rachis with bristles