

Short communication

Emmer (*Triticum dicoccon* Schrank) in Oman[†]

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Abstract

Emmer (*Triticum dicoccon*) was collected recently in northern Oman. The material was analyzed morphologically and phenologically. It belongs to the Asiatic emmers (subsp. *asiaticum*) and not to the Ethiopian ones (subsp. *abyssinicum*), distributed in Ethiopia and Yemen, as originally expected. The determination of the material resulted in var. *haussknechtianum* and var. *aeruginosum*.

Introduction

Emmer belongs to the oldest crops of the world (Zohary and Hopf 1993; Damania 1998). Emmer was domesticated from the wild progenitor *Triticum dicoccoides* (Körn. ex Asch. et Graebn.) Schweinf. in its area of natural distribution, that is in the mountains of the Fertile Crescent, in Iran, Iraq, Jordan, Syria, Israel and Palestine (Perrino et al. 1996). Later on, the domesticate experienced a large distribution from Northern Africa through most parts of Europe and the Mediterranean area to Central Asia (Szabó and Hammer 1996; Filatenko et al. 2001). In the South the emmer reached Ethiopia. But there have been no relevant reports of emmer from the Arabian peninsula (Schwartz 1939; Mandaville 1990) with the exception of Yemen from where it was reported under the folk-name of 'alas' (Flaksberger 1935; Dorofeev et al. 1979; Wood 1997). The same folkname was reported for the first time from Oman in the last decennium of the 20th century

(Guarino 1990) indicating the long overlooked *Triticum dicoccon* Schrank for remote parts of Northern Oman. New exploration confirmed the existence of emmer in Oman. In March 2002 it was possible to collect seeds (Hammer et al. in print) as a contribution to conserve and use the genetic diversity of emmer.

Material and methods

Six populations of emmer have been collected in Oman in 2002, however recent cultivation of this crop was observed, that is all samples have been obtained from seed stores. Soon after collecting, the material was grown in experimental fields at Witzenhausen (Germany) in May 2002. Four samples showed a reasonably good germination and could be used for a phenological and morphological examination (anatomical differences have been already described by Percival 1921), according to the standard procedure developed by the Vavilov-Institute in St. Petersburg (Russia) (Dorofeev et al. 1979). Chromosome numbers were counted from the root-tips of germinating plants using aceto-carmin as a colorant.

[†]Dedicated to the memory of the outstanding Armenian wheat researcher P.A. Gandiljan (15-3-1929–26-3-2001).

Results and discussion

Different morphological types could be found during a first evaluation of the seed samples. All samples contained also seeds of *Triticum durum* Desf., *T. aestivum* L. s.l., *Hordeum vulgare* L. s.l., *Avena sativa* L. ($2n = 42$ according to our determination) and other crop plants, such as *Raphanus sativus* L. and weeds.

Description of the emmer-plants: Root system little developed. Plant height low or medium (Misfat village, no. 4). Number of shoots per plant low (Misfat, no. 3, somewhat higher). Straw very thin (2.0–2.5 mm), somewhat thicker in Misfat (no. 3). Straw filled or nearly filled, also in the uppermost internodia. Leaves erect, nearly touching the shoot. Leaf-blades short (upper leaf 11–28 cm), narrow (3–10 mm), silky pubescent. Upper leaves with a few cilia. Leaf blade generally without hairs, very seldom with some short hairs. Spikes short, medium dense or dense ($D = 30\text{--}44$). Awns 1.5–2 times longer than the spike, soft. Empty glumes oblong egg-shaped with a short keel-tooth. Side nerve little developed, tapering into a small elevation. Shoulder absent (see Figure 1). Grain 8–10 mm long, 2.0–3.0 mm high and 2.0–3.0 mm wide, of dark colour.

Some characters resembled the emmers of Ethiopia (*Triticum dicoccon* subsp. *abyssinicum* Vav.), which are also distributed in Yemen (Wood 1997) and India, particularly filled straw, cilia on the silky-pubescent upper leaf blades, spikes oblong-rhombic, straw and anthers violet. These characters can be interpreted as a special adaptation to the conditions of Southern Arabia.

But most of the characters observed prove that the material belongs to Asiatic emmer (*T. dicoccon* subsp. *asiaticum* Vav.). A detailed infraspecific determination resulted in var. *haussknechtianum* A. Schulz and var. *aeruginosum* Flaksb. which are the most common races from Asia. Both races belong to convar. *transcaucasicum* Flaksb., the known distribution of which also includes Iran.

Therefore, the introduction of emmer into Oman might have occurred from Iran via the Gulf of Oman. The time of introduction is still unclear. Similar introduction routes could be shown for *Coriandrum sativum* L. in which a specific race has been described from Oman (var. *omanense* Diederichsen – Diederichsen and Hammer 2003).



Figure 1. A sample of *Triticum dicoccon* subsp. *asiaticum* var. *haussknechtianum* from MAF Bahla (North Oman) reproduced in Witzhausen (23. 07. 2002). x 1.

Based on morphological and phenological traits, the emmer from Oman is not closely related to races from Ethiopia and Yemen. Route and especially time of introduction are still open for further research.

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