STUDIES ON *CRUCIFERAE:* IX. *ERUCASTRUM RIFANUM* (EMBERGER & MAIRE) GÓMEZ CAMPO, COMB. NOV.

by

CÉSAR GÓMEZ-CAMPO *

Abstract

GÓMEZ-CAMPO, C. (1982). Studies on Cruciferae: IX. Erucastrum rifanum (Emberger & Maire) Gómez-Campo, comb. nov. *Anales Jard. Bot. Madrid* 38(2):353-356.

The new combination *Erucastrum rifanum* (Emberger & Maire) Gómez-Campo is proposed for the plant originally described as *Brassica rifana* Emberger & Maire and its identity with the taxon *Brassicella coincyoides* Humbert & Maire var. *leptocarpa* Maire is established. The species shows a disjunct area in the Rif and Middle Atlas mountains. Chromosome number is $2n = 16$, but a morphologically distinct population in Jbel Tidighin (var. *grandiflorum)* has $2n = 32$.

Resumen

GÓMEZ-CAMPO, C. (1982). Estudios sobre crucíferas: IX. Erucastrum rifanum (Emberger & Maire) Gómez-Campo, comb. nov. *Anales Jard. Bot. Madrid* 38(2):353-356 (En inglés).

Se propone la nueva combinación *Erucastrum rifanum* (Emberger & Maire) Gómez-Campo para la planta descrita originalmente como *Brassica rifana* Emberger & Maire y se establece su identidad con el taxon *Brassicella coincyoides* Humbert & Maire var. *leptocarpa* Maire. La especie muestra un área disyunta en las montañas del Rif y del Atlas Medio. El número cromosomático es $2n = 16$ pero una población morfológicamente distinta del Jbel Tidighin (var. *grandiflorum)* tiene $2n = 32$.

MATERIAL AND METHODS

Specimens from the herbaria RAB, BCF, MA, P, BM and MPU were studied. Three natural populations (Imasinen, Targuish and Jbel Tidighin) were observed in the wild. Living material obtained from seeds of these populations was cultivated and studied in Madrid. Chromosome numbers were determined after fixation of root tips with Carnoy fluid and staining with acetic orcein. Roots were pretreated for 48 hrs at 0° C in tap water.

Erucastrum rifanum (Emberger & Maire) Gómez-Campo, **comb. nov.**
≡ *Brassica rifana* Emberger & Maire, Mém. Soc. Sci. Nat. Maroc 17:26 (1927).

(*) E.T.S. Ingenieros Agrónomos. Universidad Politécnica. Madrid-3.

Synonyms: *Brassica cossoneana* Boiss. & Reuter var. *rifana* (Emberger & Maire) Pau & Font Quer, Iter maroccanum n.232 (1927). *Hirschfeldia varia* (Durieu) Pau var. *coincyoides* (Humb. & Maire) Pau, Iter maroccanum n.188 (1929). *Brassica fruticulosa* Cyr. subsp. *dolichocarpa* Emberger & Maire, Mém. Soc. Sci. Nat. Maroc 21-22:17 (1929). *Brassicella coincyoides* Humb. & Maire var. *leptocarpa* Maire, Cavanillesia 4:6 (1931). *Brassica fruticulosa* Cyr. subsp. *rifana* (Emberger & Maire) Maire var. *eu-rifana* Maire in Jahandiez & Maire, Catalogue des Plantes du Maroc 2:288 (1932). *Brassica fruticulosa* Cyr. subsp. *rifana* (Emberger & Maire) Maire var. *dolichocarpa* Maire in Jahandiez & Maire, Catalogue des Plantes du Maroc. 2:288 (1932). *Brassicella erucastrum* (L.) O. E. Schulz subsp. *coincyoides* (Humb. & Maire) Maire var. *leptocarpa* Maire in Jahandiez & Maire, Catalogue des Plantes du Maroc 2:289 (1932). *Brassicella monensis* (L.) O. E. Schulz subsp. *coincyoides* (Humb. & Maire) Maire var. *leptocarpa* Maire, Flore de l'Afrique du Nord 12:220 (1964). *Rhynchosinapis leptocarpa* (Maire) Gómez-Campo & Tortosa, Bot. J. Linn. Soc. 69:113 (1974).

The above synonyms could be arranged into two series: a) those under *Brassica,* where the identity between the Rifian and the Atlasic plants is already recognized by JAHANDIEZ & MAIRE (1932), and b) those under *Hirschfeldia, Brassicella* and *Rhynchosinapis*. The duality is successively maintained in the *Iter Maroccanum,* the *Catalogue des Plantes du Maroc* and the *Flore de l'Afrique du Nord.* A suggestion that both series might refer to the same taxon is included in the work of SALMEEN (1979).

The cause of the confusion seems now to be clear. For some Rifian populations (as that of Imasinen) the main nerve of the fruit valves does not appear quite precisely marked, so that the plants were accordingly referred to *Hirschfeldia* or *Brassicella.* In our opinion, such character is variable and only locally present. Therefore, its taxonomic value should be considered very low.

Geography

Known localities for this species are as follows:

RIF RANGE: Sidi Nau-Noh, supra Isaguen Seguer, *Font Quer,* 1929, BCF 110695; Quercetis juxta Imasinem (Beni Seddat), 1.750 m, *Font Quer,* 1929, MA 46490 and BM. Rif, 1.300-1.400 m, chennaies degradés schist, *Emberger,* 1929, RAB 17869. Inter Targuish et Llano Amarillo 13 km Parador, *Sauvage, Jovet-Ast., Jovet & Pavon,* 1955, MPU. Túnel E. de Ketama, *Gómez-Campo,* 1972, MA. Jbel Tidiguin, Southern aspect, 2.100 m, *Gómez-Campo,* 1976, MA. Rupibus calcareis montis Azrou, 1.800-2.000 m, *Emberger,* 1926, RAB 17868 (typus) and 17863. In declivibus arenaceis inter Targuish et Imasinen, *Font Quer,* 1927, BCF 110698. Supra Targuish, *Font Quer,* 1927, BCF 110705. Lapidosis schistaceis supra Targuish, 1.200 m, *Maire,* 1929, MPU. Rive droit de l'oued Gliis, 1.300 m, *Emberger,* 1929, RAB 17872. Chennaies entre Targuish et Imasinen, 1.300 m, *Emberger,* 1929, RAB 17871. Chennaies degradés de *Q.ilex* rive droit l'oued Glis, 1.300 m, *Emberger,* 1929, RAB 17870. Dumosis incultis vs. Tizi Iffri, 1.100 m, *Font Quer,* 1927, BCF 03878.

MIDDLE ATLAS: Ahermoumou, 900 m, argill. calc., Au «badj des pins», *Emberger,* 1927, RAB 17866 (EMBERGER & MAIRE, 1929). Cedraies de la vallée de l'acif Soufouloud, 2.000 m, *Emberger,* 1929, RAB 17863 and 17865. Prope Beni-Abdellah, 2.000 m, Moussa ou Salah, *Emberger,* 1927, RAB 17864. In silvaticis prope Tizi-n-Tantatart (EMBERGER & MAIRE, 1929).

Thus, two disjunct sub-areas make up the area of distribution of *Erucastrum rifanum.* One is approximately defined by the triangle Ketama-Targuish-Aknoul in the Rif mountains. The other corresponds to the region of Ahermoumou in the Middle Atlas.

An altitudinal barrier seems to separate *E. rifanum* from its close ally *E. littoreum.* The latter is frequent in the coastal Boccoia mountains where the altitude is usually below 800 m. On the contrary, *E. rifanum* localities are between 1.100 and 2.100 m. At Jbel Azrou, they both seem to co-exist, *E. rifanum* in the highest areas and *E. littoreum* in the lower surrounding ones.

Karyology

Chromosome number has been found to be $2n = 16$ at least for two populations (Imasinen and Targuish). This coincides with a previous count of HARBERD (pers. comm.) on Imasinen material. However, material from Jbel Tidighin had $2n = 32$ thus suggesting a possible autotetraploid origin. The same basic number $n = 8$ is shared by the *Erucastrum littoreum* group and also by the *Brassica fruticulosa* complex, both of which are considered as relatives of *Erucastrum rifanum.* It is to be noted that *Hutera* (syn. *Rhynchosinapis)* has $n = 12$ and *Hirschfeldia* has $n = 7$. There are other *Erucastrum* species with $n = 7$ and $n = 9$ (GÓMEZ-CAMPO & HINATA, 1980).

Taxonomy

We propose the new combination *Erucastrum rifanum* (Emb. & Maire) Gómez-Campo *comb. nov.* for the taxon described under the basionym *Brassica rifana* Emberger & Maire, Mém. Soc. Sci. Nat. Maroc 17: 26 (1927). The ascription to the genus *Erucastrum* is based on the general aspect of the plant, but also mainly on the oval or ellipsoidal shape of its seeds. Non spherical seeds are constantly present in *Erucastrum,* while evolved members of the genus *Brassica* (among which *B. fruticulosa* is included) as well as all the species of *Hutera* (syns. *Brassicella* and *Rhynchosinapis)* always show spherical seeds.

From a phylogenetic point of view, *E. rifanum* might perhaps represent a variation which is somewhat in the direction of *B. fruticulosa* characters, and this seems to be supported at least by the elongated shape of its median nectaries. Similarly, the aspect of *B. fruticulosa* subsp. *cossoneana* might suggest a relationship to *Erucastrum littoreum.* The geographic distribution of the whole group and their common basic chromosome number $n = 8$ also seem to indicate some possible phyletic relationship linking *Erucastrum* to *Brassica.* But from a taxonomic point of view it is clear to us that the line should be traced according to the criterium here exposed, i.e. the sphericity of the seeds.

Sometimes confusion between *E. rifanum* and *E. littoreum* has ocurred, but the latter can be easily distinguished by its shorter erecto-patent fruits; those of *E. rifanum* are longer and very often patent or deflexed. Distinction from *Hutera coincyoides* (which is nearly sympatric to *E. rifanum* in some high localities as Jbel Tidighin) is also simple because the fruits of *Hutera* are more robust and may have several seeds in their beak. The beak of *E. rifanum* is very often asperm, but it can also contain a single seed.

The tetraploid material from Jbel Tidighin has longer petals (11-12 mm against 8 mm) and fruits (9-10 cm against 6-7 cm) in relation to the type. Thus we wish to describe it as a new variety as follows: **Erucastrum rifanum** (Emberger & Maire) Gómez-Campo var. **grandiflorum** Gómez-Campo, **var. nov.**: *«differt petalis et siliquis longioribus»*. **Typus:** Rif mountains. Jbel Tidighin, 2.100 m, exp. S, IX-1976. Gómez Campo *leg.* (MA).

BIBLIOGRAPHIC REFERENCES

EMBERGER, L. & R. MAIRE (1929). Matériaux pour la Flore marocaine. *Mém. Soc. Sci. Nat. Maroc* 21-22:21-53.

GÓMEZ-CAMPO, C. & K. HINATA (1980). Check-list of chromosome numbers in the tribe Brassiceae. *In:* S. Tsunoda & *al.* (Eds.), *Brassica crops and wild allies:* 51-63. Japan Scientific Societies Press. Tokyo.

JAHANDIEZ, E. & R. MAIRE (1932). *Catalogue des plantes du Maroc* 2:160-557. Alger.

MAIRE, R. (1931). Observations sur quelques plantes du Maroc Septentrional. V. *Cavanillesia* 4; 5-19.

SALMEEN, O. (1979). *A systematic revision of the genus Brassica in the Mediterranean region.* PhD. Thesis. University of Reading.

Aceptado para publicación: 2-X-81