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Capparis in the East Mediterranean countries

Abstract

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The author reports the status of knowledge on *Capparis* in the East Mediterranea countries with special regard to Israel on the basis literature, the revision of the specimens housed in HUJ and on field studies. A new species from Jerusalem is here described and named *C. hierosolymitana*. In addition a tentative key for the caper species in Israel is presented.

Key words: *Capparis hierosolymitana*, Israel, caper.

Introduction

The perception of *Capparis* in the East Mediterranean countries does not make me satisfied when compared with the distribution of the various species in Israel, Jordan, Sinai, north-eastern Egypt, and Crete. In this area I saw plants in the field and observed many populations the year round. My hobby is to collect the flowering buds, young stems, and young fruits, pickle them for home consumption. This practice led me to repetitive observations of the important organs of the plants. Tasting their flavor may be regarded as a preliminary comparative chemical test of the plants. It is very difficult to come to conclusions basing on herbarium specimens alone.

Due to the difficulties of having authentic material and information in countries inaccessible to authors, gapping with such material and extending the taxonomy of *Capparis spinosa* in its wide sense over large areas had led lumping strategies to dominate the taxonomic decisions. As a result authors of new floras tend to make a compromise with previous reviews, although many authors did not use all the characters which differentiate the real species in the field. In the following account I wish to present my concept of the taxa in Israel where I know it best (including the culinary chapter).

Typification and recognition of several *Capparis* species

Burtt & Lewis (1950) typify *Capparis spinosa* L. Sp. Pl. 1: 503 (1753), and state that the type is the specimen of *Capparis aculeata* in Hortus Cliffortianus herbarium (BM).

The following text (in Hort. Cliff. p. 203) describes the habitats and distribution of *C. aculeata*: Crescit in locis arenosis, ruderatis, muris, inter & super lapides Romae, Senarum, Florentiae & alibi in Italia, semper in locis durissimis aridissimis. Typifying the Linnean species demands, among others, the understanding what was the material available to Carolus Linnaeus while describing a certain species. However distribution given by Burtt and Lewis (1950): "Widespread from western Mediterranean countries to Afghanistan" was a lumping statement which might have influenced many authors who followed them. Jacobs (1965) saw the specimen at Hort. Cliff. (BM) and wrote that it is sterile. I believe that the important issue is that Linnaeus thought of the Italian populations as the type for his species. The populations of what Linnaeus saw at the beginning of the eighteen century still grow there and I wish to rely on these populations to get what Linnaeus named *Capparis spinosa*.

When relating to fruit morphology I refer to the silhouette or to a longitudinal cross section through the fruit's center. The outline is compared to the chart of simple symmetrical plane shapes (Stearn 1966: 318-319)

The typical *C. spinosa* may be seen by anyone who visits Rome and southern Italy, where it grows on every brick wall of the very common ancient Roman aqueducts (Fig. 1a). A diagnostic description of this taxon is presented by Fiori & Paoletti (1896-1898), Fiori (1923-1925) and Pignatti (1982). The plant is glabrous and has narrowly ovate to ovate fruits (2.5:1) (as illustrated by Pignatti 1982, p. 367), fruit green at early stages becoming red when opened at maturity and seeds black with white parenchyma between them.

Lamarck (1785) describes *C. aegyptia* and mentions it's glaucous or blue leaves – a very important character according to my observations. There is no specimen of this species in the microfiche of Lamarck's herbarium, but there is a statement in his account that Lippi observed it in Egypt. Lamarck's species was reduced to varietal rank by Boissier (1867), naming it *C. spinosa* var. *aegyptia* (Lam.) Boiss. Zohary (1960) adopted this name for the common Mediterranean taxon of caper in Israel. A somewhat similar concept is held by Boulos (1999). He lumps *C. aegyptia* into the Italian taxon by stating that the Egyptian taxon is *C. spinosa* L. var. *spinosa.* I can't agree with both latter authors as I saw and collected *Capparis aegyptia* in mainland Egypt (at Gebel Ataqa), in northern Sinai, in the Negev Highlands, in the Judean Desert, along the Dead Sea shores, and in SW Jordan's Aqaba - Petra region. In all these places the caper has blue leaves in summer and covered by a thin layer of wax. The leaves become succulent, twice or three times as thick when blue as their green state in the spring. It is an evergreen plant and from the axile of the blue summer leaves new stems sprout in February (in the warm Dead Sea area) or April (in the cold Petra area) and carry in their axils new stems with green and thin leaves. Later the blue leaves of the previous year fall and the green leaves of the new year become thicker and blue. The internal side of the ripe fruit wall is white and not red as described for the typical *C. spinosa.* The fruits are narrowly ovate (3.5-4:1). Consequently, Zohary (1960) was wrong because the typical Mediterranean caper of Israel is a winter-deciduous (sheds leaves and leaf-carrying stems by October-November; new stems sprout by April, May, or June according to the elevation of the specific site). It does not have as blue leaves as those of *C. aegyptia*. The taste of the pickled flowering buds of *C. aegyptia* is hot when compared to that of the typical Mediterranean caper of Israel. The true *C. aegyptia* was named by Zohary (1960, 1966) *C. spinosa* var. *araven-*

sis Zohary. This opinion was not accepted by Feinbrun-Dothan & Danin (1991; *Apopetala* was my responsibility in that book) because I believe that the true *C. aegyptia* is worth a specific level recognition and should remain in taxonomic use.

The comments by Jacobs (1965) on Zohary's (1960) account concerning the understanding of the *C. spinosa* complex have to be critically regarded. Jacobs covered the whole genus in his revision and this might gave him a general overview. However, for those who know *C.sinaica* (syn. = *C. cartilaginea,* which has buds 5 cm long, and highly zygomorphic, see key below*)*, to find it as a synonym to the caper which grows on the walls of Rome and has buds 1 cm in diameter, indicate that the *C. spinosa* group was understood by Jacobs (1965) in a non-practical way. In addition Jacobs (1965) did not even mention *C. aegyptia* or *C. spinosa* var. *aegyptia* in his article.

Boulos (1999) wrongly adopted *C. spinosa* L. var. *spinosa* for the taxon that was originally named *C. aegyptia*. This because the common Egyptian caper has fruits that are white inside and not red as the Linnean *C. spinosa* from Italy; it is an ever-green (and not winter deciduous), and has blue leaves in summer (and not green as in Rome !). It has narrowly ovate fruits with size ratio of 3.5-4:1 (and not narrowly ovate to ovate with size ratio of 2.5:1).

According to Chaudhary & Al Jowaid (1999) and Chaudhary, (1999) the mature fruits of *C. spinosa* the way they see it split open and turn inside out exposing the black seeds over the red fleshy fruit wall. It is totally shedding its leaves and stems towards winter. These properties are in agreement with Pignatti's (1982) description of the Linnean caper, but the gap of several thousand kilometers in the discontinuity of these properties call for further investigations. The treatment of the *C. spinosa* complex in Europe (Higton & Akeroyd 1991) could not be applied here. The latter deals with the morphology and taxonomy of the European taxa which do not grow in the east Mediterranean countries.

The taxon *Capparis sicula* Veillard has fruits with inner red wall (when ripe), it is always hairy throughout on stems, leaves and buds. Its flowers are more zygomorphic than those of the typical Mediterranean caper of Israel and of *C. aegyptia*. It is confined to disturbed habitats of the rift valley from Jericho northwards. I saw it in the same habitat in Crete where it was named with this epithet by Greuter (1974, pers. comm. in the first OPTIMA meeting and Greuter & al. 1984).

Capparis hierosolymitana **Danin spec. nova**
Type: Israel: Jerusalem, walls facing west of Old Jerusalem, 27.7.1999 (holo, HUJ!; iso E, B, PAL, K!).

A *Capparis spinosa* L. differt spinis stipularibus oppositis prominentis recurvatis (nec inermis) atque fructibus maturis apertis interne albis nec rubris; a *C. aegyptia* Lam. differt habitu plene deciduo hieme igitur ramis spinosis foliis carentibus (nec habitu semper-virente hieme folia crassa glauca exhibente), praeterea fructibus ovatis latitudine 1.5-2.5-plo longis (non anguste-ovatis latitudine 3-5-plo longis); a *C. sicula* Veillard differt aspectu juvenili glabro vel glabrescente nec semper omnino hirsuto etiamque fructibus maturis apertis interne albis nec rubris.

C. hierosolymitana is described in detail by Zohary (1966) p. 242 under *Capparis spinosa* var. *aegyptia*; Zohary's description for *C. spinosa* var. *aravensis* should be considered as for *C. aegyptia* Lam.

The typical Meditteranean caper of Israel grows also in Jordan, Lebanon (Nehmé 1978; Mouterde 1986), Cyprus (Meikle 1977), and eastern Crete (I saw it October 1998 east of Agios Nikolaos). I suggest to name it *Capparis hierosolymitana* as it is typically growing on the walls of Jerusalem, and to honour one of the builders of the walls in Ezra and Nehemaya time (ca. 2400 years ago), namely Hanoun Ben (the son of-) Tzalaf (= the ancient Hebrew name of the genus, probably referring to our species). It has elliptic fruits with size ratio of 1.5-2.5:1.

The population of the 300-400 m elevation of the Judean foothills is in full bloom April-May; the populations of the 650-800 m elevation hills of Jerusalem and of 1000-1200 m neare Majdal Shams are in full bloom May-June; when visiting Dana Nature Reserve, SW Jordan, at the beginning of July, 1996 the population there was in full bloom.

The most common habitat of *C. spinosa* L. in southern Europe is limestone cliffs and old walls where it has a pendulous morphology. *C. hierosolymitana* grows on cliffs and old walls as well, and also has a pendulous habit there (Fig. 1b). However, its most common habitat is open hilly landscape and disturbed ground near roads. In both habitats it has an ascending or decumbent morphology. It is a dominant shrub in a large area at the Judean foothills on soft limestone covered by a hard limestone crust (Nari or caliche). In this habitat there are many specimens having a lignified trunk 1-3 m high and ca 10 cm in diameter; the renewal buds sprout every spring at the top of the trunk. It also germinates on the side of newly constructed roads, where competition of the local vegetation is minimal due to the disturbance. It may last there dozens of years. Such are the shrubs growing on the 5-10 m strip of the roadside between Majdal Shams and Mt. Hermon, which prosper since 1968 when the asphalt road was constructed.

The caper species touch a wide range of issues which are hard to cover in a taxonomical review. I suggest the reader to expand the information on the capers through an illustrated chapter using the link to my website: http://flora.huji.ac.il/browse.asp?action =content&keyword=useful_plants_e5

A tentative key for the caper species in Israel

1. Leafless shrubs or small trees with green branches and trunks. Leaves when present minute, linear to linear-oblong. Corolla red.....*C. decidua*
1. Leafy shrubs, leaves mostly broadly ovate. Corolla white.....2
2. Evergreen with bright green leaves, buds pre-anthesis 5 cm long, flowers strongly zygomorphic, ripe fruits red outside orange inside.....*C. sinaica*
2. Evergreen with summer-blue leaves or winter deciduous with green leaves, buds pre-anthesis 1-2 cm long, flowers zygomorphic, ripe fruits green, white or red inside.....3
3. Inner wall of the ripe fruit red, densely hairy.....*C. sicula*
3. Inner wall of the ripe fruit white to yellowish, glabrous or glabrescent.....4
4. Winter deciduous with green leaves (Fig. 1c); fruit ovate 1.5-2:1 (Fig. 1d).....*C. hierosolymitana*
4. Evergreen with summer-blue leaves; fruit narrow-ovate 3-5:1 (Fig. 1e).....*C. aegyptia*

Fig 1. a. Pendulous *Capparis spinosa* non-thorny plants in Selinunte (Sicily); b. pendulous *C. hierosolymotana* thorny plants on the ancient calcareous "Western Wall" in Jerusalem; c. a blooming branch at sunset when flowers completely open. A pair of hard recurved stipular thorns is seen at the base of each leaf petiol; d. oval ripe fruits opened and displaying black seeds with a white background of fruit wall and among-seeds parenchyma. Stipular thorns prominent; e. a shrub of *C. aegyptia* with bluish leaves and narrow-ovate fruits.

Specimens seen

Capparis hierosolymitana Danin
Israel: Jerusalem, walls facing west of Old Jerusalem, 27.7.1999 (holo, HUJ!; iso E, B, PAL, K !); Sharon Plain: 1 km N of Caesarea, sandy soil, 13.5.1960, M. Zohary (HUJ!); Pleshet, Asqelon, 15.6.1957, Waisel (HUJ!); Mt. Carmel, 3.10.1951, Boskovitz (HUJ!); Dan Valley, Tel el Qadi, 26.7.1954, Yaffe (HUJ!); Upper Galilee, Haquq, 6.6.1957, M. Zohary (HUJ!); Samaria, En Hashofet, 22.5.1947 (HUJ!)
Lebanon: Saida (Syrie), 15.6.1856, Gaillardot 811 (HUJ!).
Syria: Damascus (Damas), 20.7.1856, Gaillardot 812 (HUJ!).
Jordan: Edom, Dana Reserve, a limestone cliff above the visitor center 9.7.1996, Danin 963403 (HUJ!); Amman, amphitheatre, 28.10.1926, Eig (HUJ!);

Capparis aegyptia Lam.
Egypt (mainland): N Galala, Wadi Nooz, rocks, 27.3.1944, Davis 7060 & 5080 (HUJ!); 6 km W of Agrur, northern foot of Gebel Ataqa, 150 m, 19.1.1974, Shmida (HUJ!); 15 km NW of Suez, at the foot of Gebel Ataqa, 12.1974, Shmida (HUJ!)
Sinai: 1930, Kaiser 190 (HUJ!); Gebel Umm Shomar, Wadi Rumhan, 1000-1200 m, 28.4.1968, Danin (HUJ!); Gebel Beida, 20 km SE of the Monastery, 1300 m, 10.8.1968, Danin (HUJ!); 10 km SE of Nebi Salah, 1350-1400 m, Danin (HUJ!); Gebel Tarfa, 8 km E of Feiran, 12.9.1968 Shmida; Wadi Butum, 20 km S of Thamad, 860 m, 12.3.1970, Shmida (HUJ!); Gebel Igma, 10.10.1969, Danin and Halevy (HUJ!); Gebel Maghara, limestone cliff, 3.9.1969, Shmida and Halevy (HUJ!);
Israel: Dead Sea Valley, Wadi Fuqra, 20.4.1954, M. Zohary (HUJ!, holotype of *Capparis spinosa* L. var. *aravensis* Zohary); Env. of the Dead Sea, Ein Gedi, Wadi Areja, 5.5.1951, D'Angelis (HUJ! Paratype of *Capparis spinosa* var. *aravensis*); Negev, north of Kurnub, 27.5.1934, Eig, Zohary, and Feinbrun 213 (HUJ!); Arava Valley, Nahal Paran, 22.4.1946, D. Zohary (HUJ!)

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References

Boissier, E. 1867: *Capparis* – P. 420 in: Flora Orientalis, **1.** – Basel.
Boulos, L. 1999: *Capparis* – Pp. 171-173 in: Flora of Egypt, **1.** – Cairo.
Burtt, B. L. & Lewis, P. 1950. On the flora of Kuwait. – Kew Bull. **1949(3):** 273-308.
Chaudhary, S. A. 1999 *Capparis*. – Pp. 448-449 in: Chaudhary, S.A. (ed.) Flora of the Kingdom of Saudi Arabia, **1.** – Riyadh.
— & Al Jowaid, A. A. A. 1999: Vegetation of the Kingdom of Saudi Arabia. – Riyadh.
Fiori, A. & Paoletti, G. 1896-1898: *Capparis*. Pp. 412-413 in Flora analitica d'Italia, **1.** – Padova.
— 1923-1925: *Capparis*. – P. 551 in: Nuova Flora analitica d'Italia.– Firenze.
Greuter, W., Burdet, H. M. & Long, G. 1984: *Capparis*. – P. 155 in: Med-Checklist, **1.** – Genéve.
Higton, R. N. & Akeroyd, J. R. 1991: Variation in *Capparis spinosa* L. In Europe. – Bot. J. Linn. Soc. **106:** 104-112.
Jacobs, M. 1965: The genus *Capparis* (*Capparaceae*) from the Indus to the Pacific. – Blumea **12(3):** 385-541.
Lamarck, C. 1785: *Capparis*. – P. 605 in: Encyclopedie methodique botanique, **1.** – Paris.
Meikle, R. D. 1977: *Capparis*. – Pp. 172-173 in: Flora of Cyprus, **1.** – Kew.
Mouterde, P. 1966: Nouvelle flore du Liban et de la Syrie – Beyrouth.

Nehmé, M. 1978: *Capparis*. – P. 173, Pl. 86 in Wild Flowers of Lebanon. – Beirut.
Pignatti, S. 1982: *Capparis*. – P. 367 in: Flora d'Italia, **1.** – Bologna.
Stearn, W. T. 1966. Botanical Latin. – Edinburgh.
Zohary, M. 1960: The species of *Capparis* in the Mediterranean and Near Eastern countries. – Bull. Res. Counc. Israel **8D:** 49-64.

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