

KICKXIA JUDAICA SP. N. (SCROPHULARIACEAE) AND SOME RELATED SPECIES FROM DESERTS OF ISRAEL AND SINAI

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ABSTRACT

A new species of *Kickxia* sect. *Elatinoides* (Chav.) Wettst. from the northern Judean Desert and eastern Samaria is described. It is confined to limestone cliffs in gorges descending to the Jordan Valley. The indumentum, flowers and seeds distinguish it from related species, *K. macilentae*, *K. acerbianae* and *K. argyptiaca*, from Israel and Sinai.

***Kickxia judaica* Danin, sp. nov. (Sect. *Elatinoides* (Chav.) Wettst.) Figs. 1 & 2**

Affinis *K. macilentae* (Decne.) Danin et *K. acerbianae* (Boiss.) Taechh. & Boulos sed differt indumento brevi glanduloso cum glandulis multicellularibus, seminibus tuberculato-verrucosis et corolla flava (nec rubro-striata-punctata). Suffrutex ramosissimus, viscidulus, glandulis stipitatis brevibus multicellularibus; rami rigidi elongati, breviter ramulosi. Folia petiolata, ovata vel triangularia, basi obtusa vel hastata. Racemi terminales, laxi, breviter bracteati; pedicelli capillares, calyce 1.5-2-plo longiores. Calyx 3-4 mm, glandulosus, laciniis subulatis. Corolla hirtula, flava, calcare tenui ea dimidio brevior. Capsula globosa, bilobata, glabra, parva, calyce subbrevior, dehiscens et persistens. Semina minuta, 0.4-0.5 × 0.2-0.3 mm, 30-60(-80), ovoidea, tuberculato-verrucosa. Fl. 3-6.

DISTRIBUTION AREA AND HABITAT: Endemic to the northern Judean Desert and eastern Samaria. Confined to vertical limestone and dolomite cliffs in gorges descending to the Jordan and the Dead Sea.

TYPE: Judean Desert: Wadi el Qilt, 'Ein el Qilt, limestone cliff, 14.III.1975, Danin (holo HUJ, iso K, E, G).

ADDITIONAL SPECIMENS*: Argaman, 25 km ESE of Nablus, (-)250 m, 2.VII.1976, Danin; 5 km SW of Sartaba, (-)200 m, 2.VII.1976, Danin; 'Ein el 'Auja, 10 km NNW of Jericho, 50 m, 16.V.1973, Danin; Wadi el Fara, 'Ein el Fara, 350 m, 31.I.1976, Danin; Wadi el Qilt, 'Ein el Fawwar, 25.VI.1976, Danin; Nahal Og, 3 km W of Nabi Musa, 2.VII.1976, Danin; near Mar Saba, 12.V.1926, Markovitch.

* Specimens deposited in the herbarium of the Hebrew University of Jerusalem (HUJ) unless otherwise stated.

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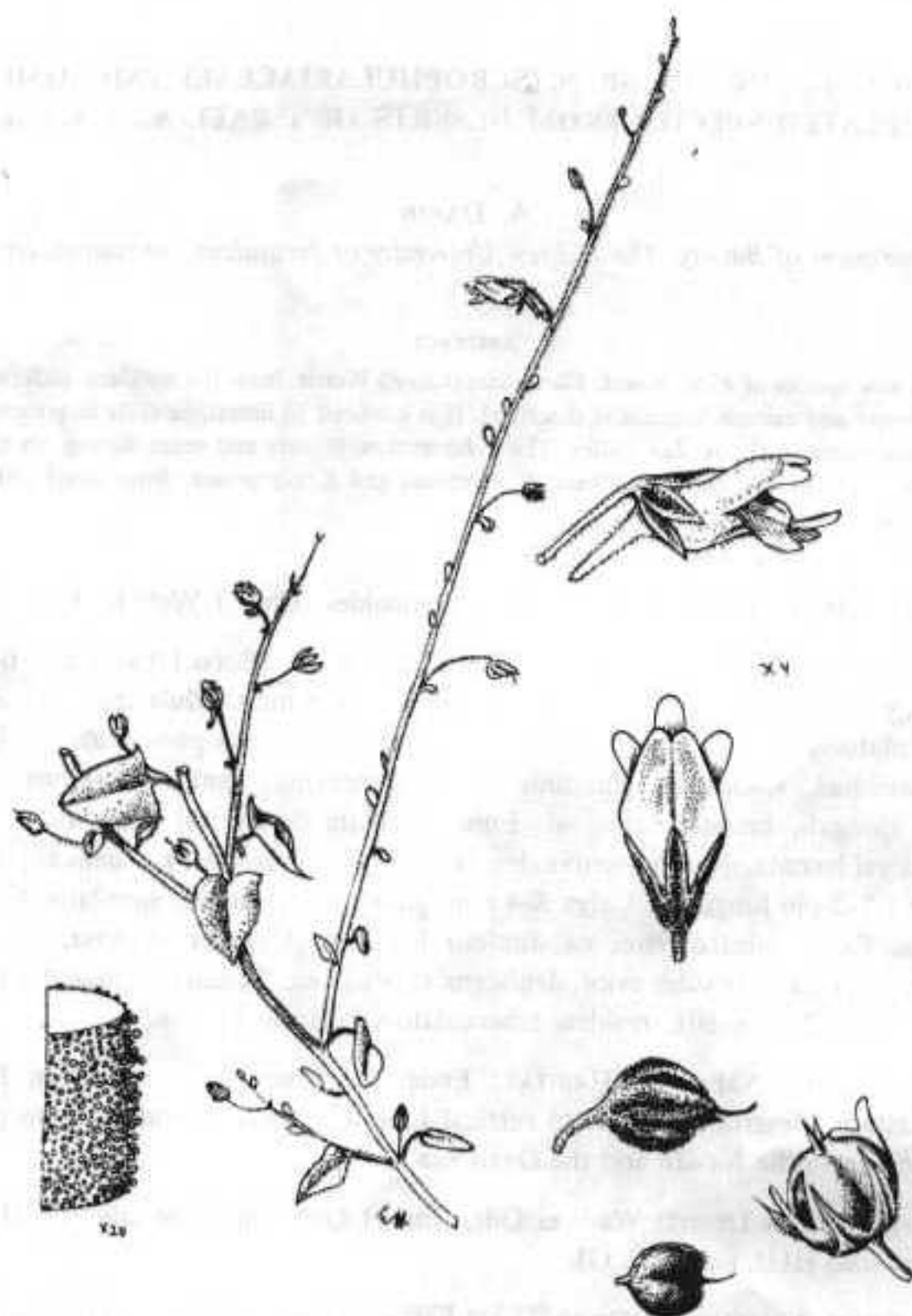


Fig. 1. *Kickxia judaica* Danin. Flowering branch (1:1), lateral and adaxial view of flower ($\times 4$), fruiting calyx, capsule ($\times 4$), capsule with opened lids ($\times 10$), section of stem showing indumentum ($\times 20$). Drawn from a plant grown from seed collected in Wadi el Qilt.

For many years *K. judaica* has been overlooked by botanists who visited Wadi el Qilt, or misidentified as *K. acerbiana* to which it bears some resemblance. The species differ in indumentum, size and colour of corolla, length of pedicel, shape of capsule and surface of seeds (Table I and Figs. 3, 5 & 6). Their areas of distribu-

TABLE I
DIFFERENTIAL DIAGNOSTIC CHARACTERS OF *Kickxia judaica* AND SOME RELATED SPECIES

	<i>K. judaica</i>	<i>K. macilentata</i>	<i>K. acerbianata</i>
Indumentum	viscid throughout with short stipitate glands	young branches somewhat scabrous at base, glabrous above	pubescent with long spreading glandular hairs
Length of pedicels at anthesis (mm)	5-6	2-2.5	0.5-1
Corolla length incl. spur (mm)	8.5-10	10-11	7-8
Corolla width at base of lip (mm)	4-4.5	3-3.5	2-2.5
Length of spur (mm)	2.5-3	4-4.5	3-3.5
Colour	yellow	yellow with red spots and veins	yellow with red spots and veins
Calyx lobes	broadly scarious at base	narrowly to not scarious at base	broadly scarious at base
Shape of capsule top	bilobate	rounded	rounded
Ratio of valve/capsule length	1/2	1/3	2/3
Habitat	hanging or overhanging from limestone cliffs	crevices of smooth-faced granite outcrops	alluvial ground in runnels, fissured limestone, dolomite, magmatic or metamorphic rocks
Altitude (m)	(-) 250-400	500-2,640	(-) 380-2,000
Annual rainfall (mm)	100-300	50-100	20-100

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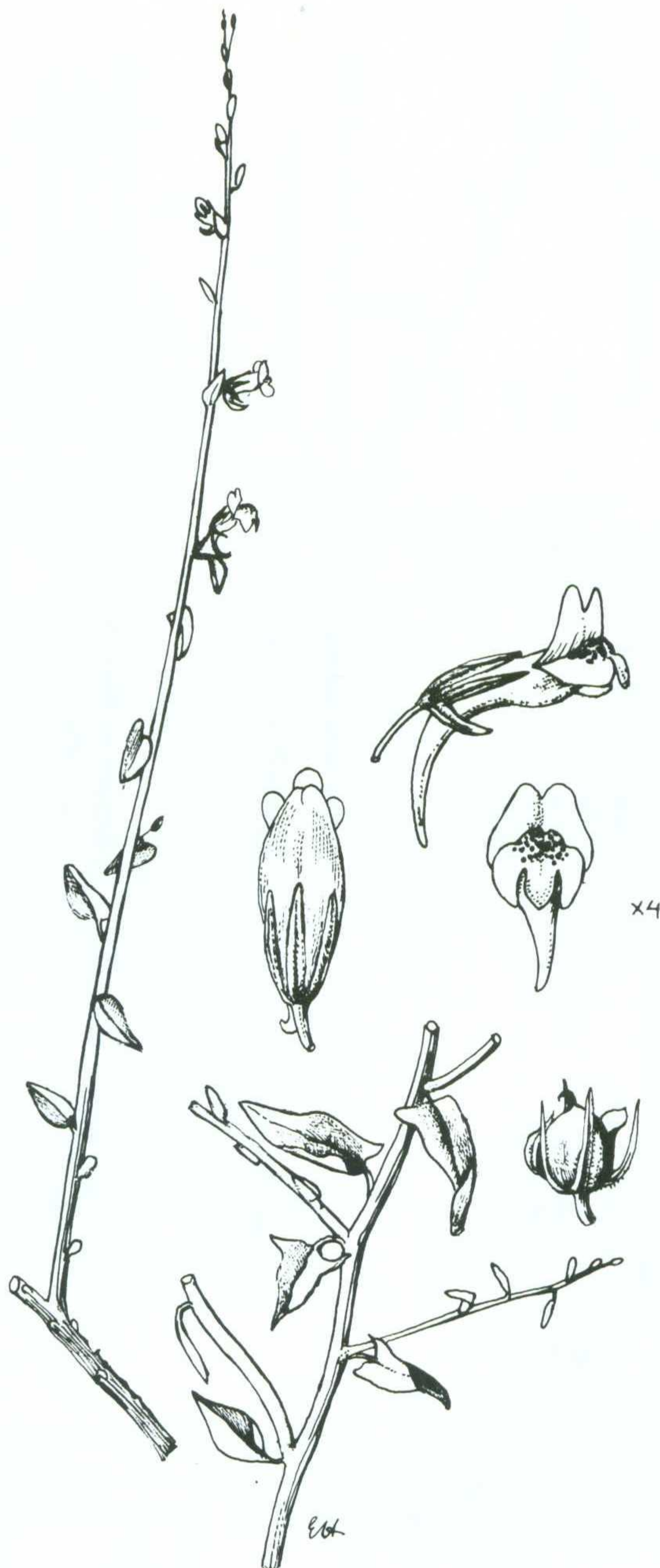


Fig. 2. *Kickxia macilenta* (Decne.) Danin. Flowering branch (1:1), lateral, anterior and adaxial view of flower ($\times 4$), fructing calyx with capsule ($\times 4$). Drawn from a plant grown from seed collected near St. Katherine's monastery.

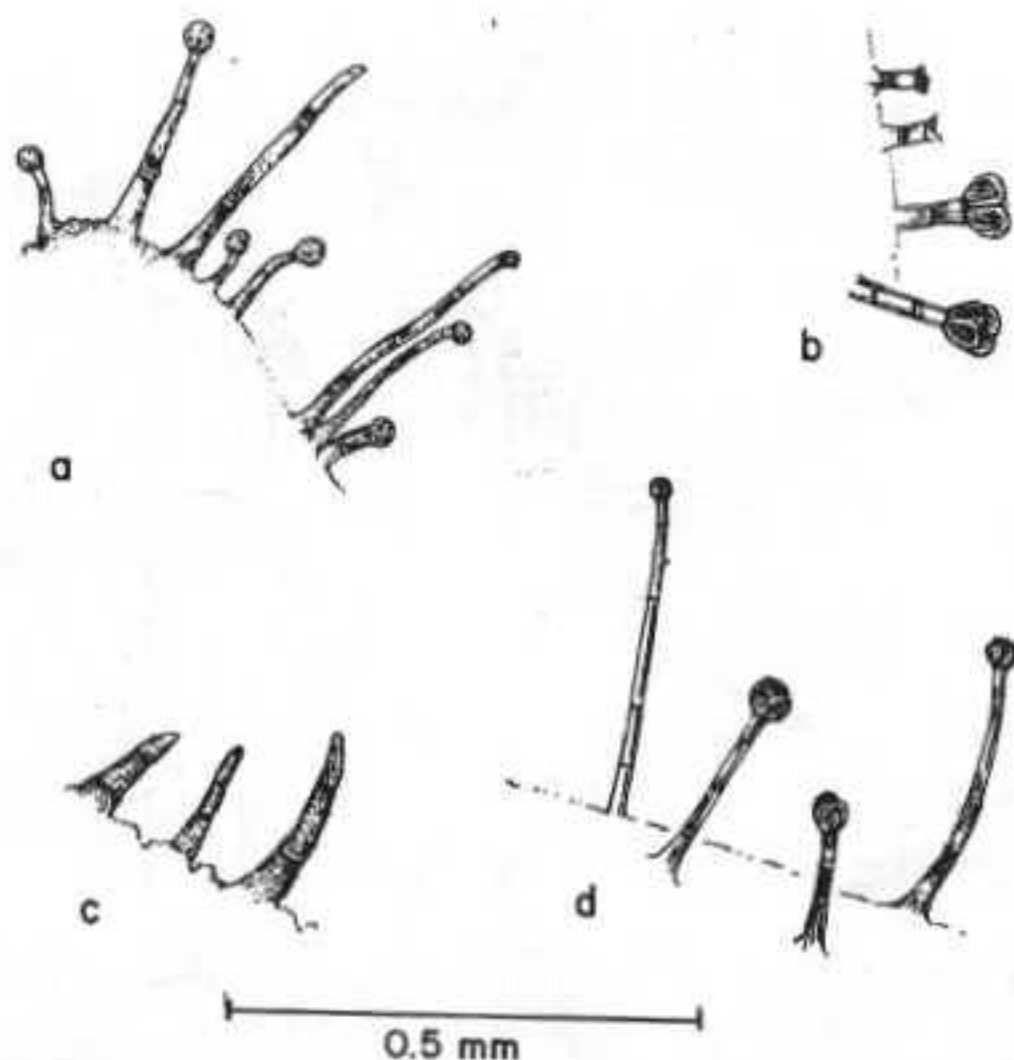


Fig. 3. Indumentum of *Kickxia* species: a. *K. aegyptiaca* ssp. *palaestina*. b. *K. judaica*. c. *K. macilenta*. d. *K. acerbiana*.

tion (Fig. 4) do not overlap and they inhabit different habitats. While *K. judaica* is a lithophyte or chasmophyte, being dominant in many stands of vertical limestone cliffs, *K. acerbiana* occurs in more diverse habitats. It grows in runnels in gravel plains as well as in fissured rock and stony ground of limestone, dolomite, magmatic or metamorphic rocks.

K. acerbiana is identical with *K. kneuckeri* (Bornm.) Täckh. & Boulos, Publ. Cairo Univ. Herb. 5: 97 (1974). *Linaria kneuckeri* was described by Bornmueller (1909) from two fruiting plants collected by Kneucker in Sinai and a flowering plant from Gebel 'Ataqa (SW of Suez), collected by Bornmueller. Comparison of Kneucker's specimen (Z!) with the type of *Linaria acerbiana* (G-Boiss.!) proved them to be identical in indumentum and shape of fruit and seed.

Another species closely related to *K. judaica* is *K. macilenta*. They differ in indumentum, size and colour of corolla, length of pedicel, shape of capsule and surface of seed (Table I and Fig. 5).

Both species are local lithophytes or chasmophytes endemic to a small area (Fig. 4). *K. judaica* inhabits vertical limestone cliffs under 100–350 mm of rainfall, whereas *K. macilenta* grows mainly in non-vertical smooth-faced outcrops of

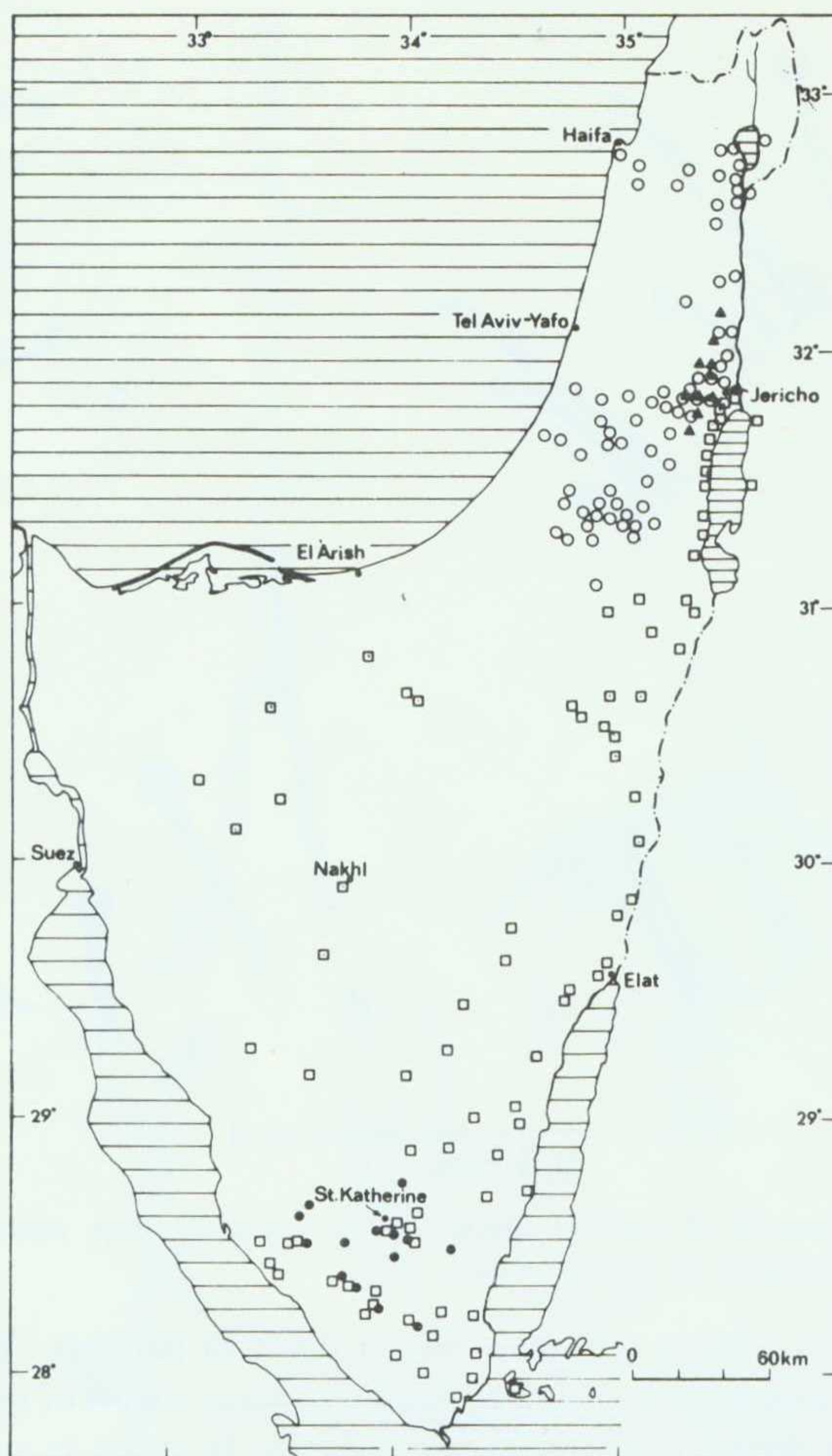


Fig. 4. Distribution map of *Kickxia judaica* (▲), *K. macilenta* (●), *K. acerbiana* (□) and *K. aegyptiaca* ssp. *palaestina* (○). Based on herbarium specimens (HUJ) and field observations.

granite rocks with less than 100 mm of rainfall. Temperature requirements are apparently different, as *K. judaica* grows at an altitude of 250 m below sea level to 350 m above sea level and *K. macilenta* at 500–2,640 m above sea level.

Kickxia judaica, *K. acerbiana* and *K. macilenta* have persistent capsules with two locules each opening by a single large pore with a valve-shaped lid. They contain 30–60(–80) seeds, $0.4\text{--}0.5 \times 0.2\text{--}0.3$ mm.

Although the above three taxa appear to be quite distinct, a cytogenetic study should be carried out to clarify the genetic relationships between them.

Kickxia aegyptiaca (L.) Nábêlek ssp. *palaestina* (Bornm.) Feinbr., a frequent component of the batha (phrygana) on slopes near the canyons inhabited by

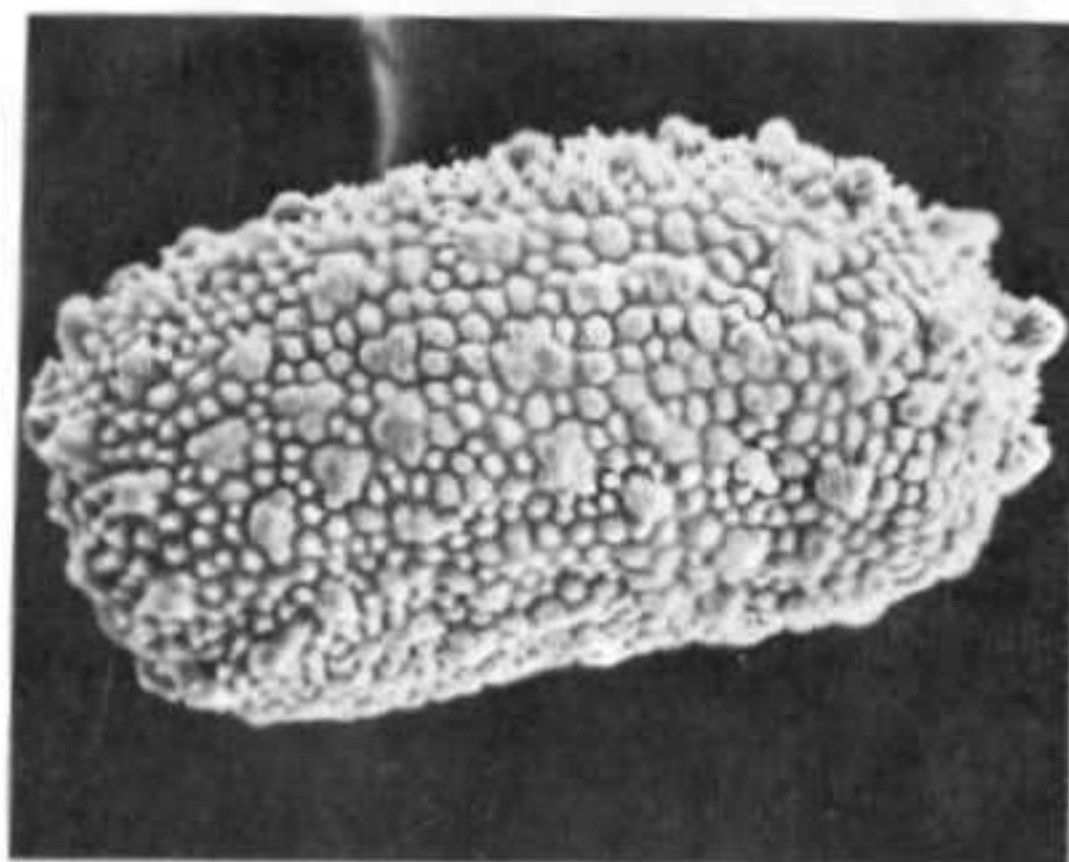
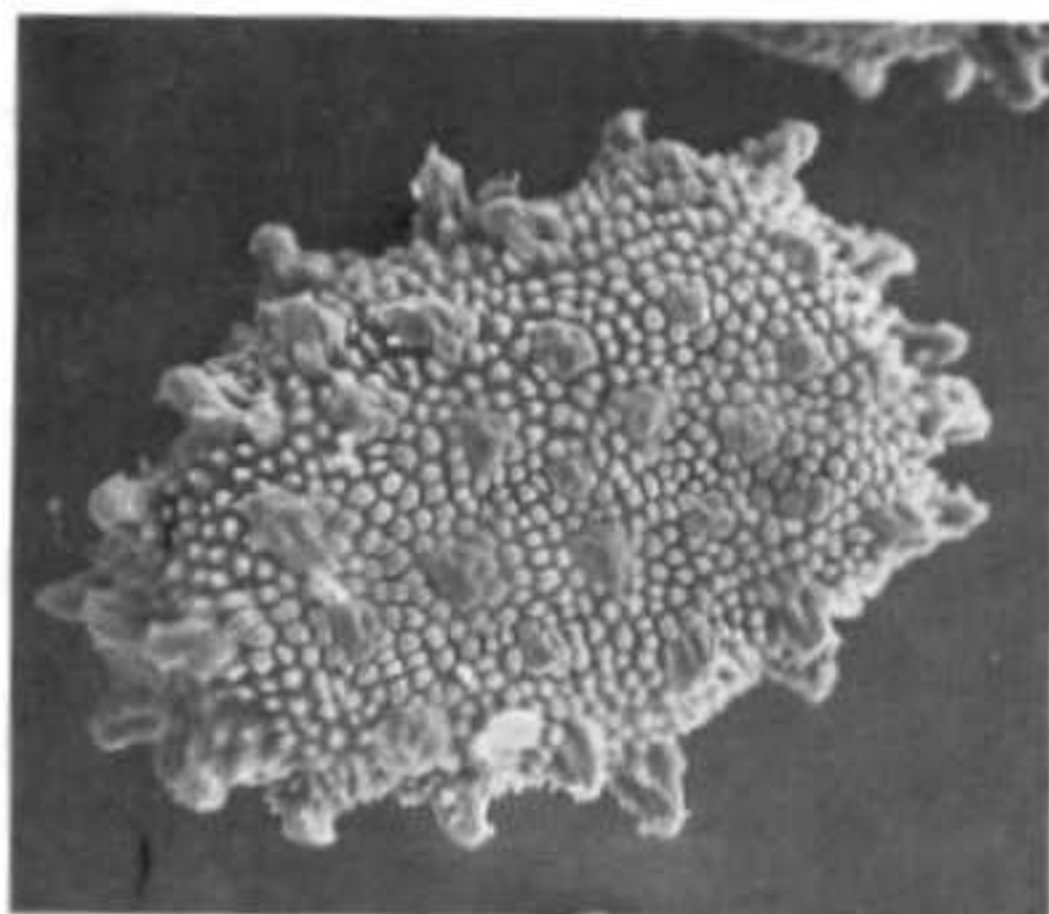


Fig. 5. Seeds of *Kickxia* photographed with scanning electron microscope (SEM, Cambridge S4/10). Above, *K. judaica* from Wadi el Qilt. $\times 165$. Below, *K. mucilenta* from Gabel Serbal. $\times 165$.

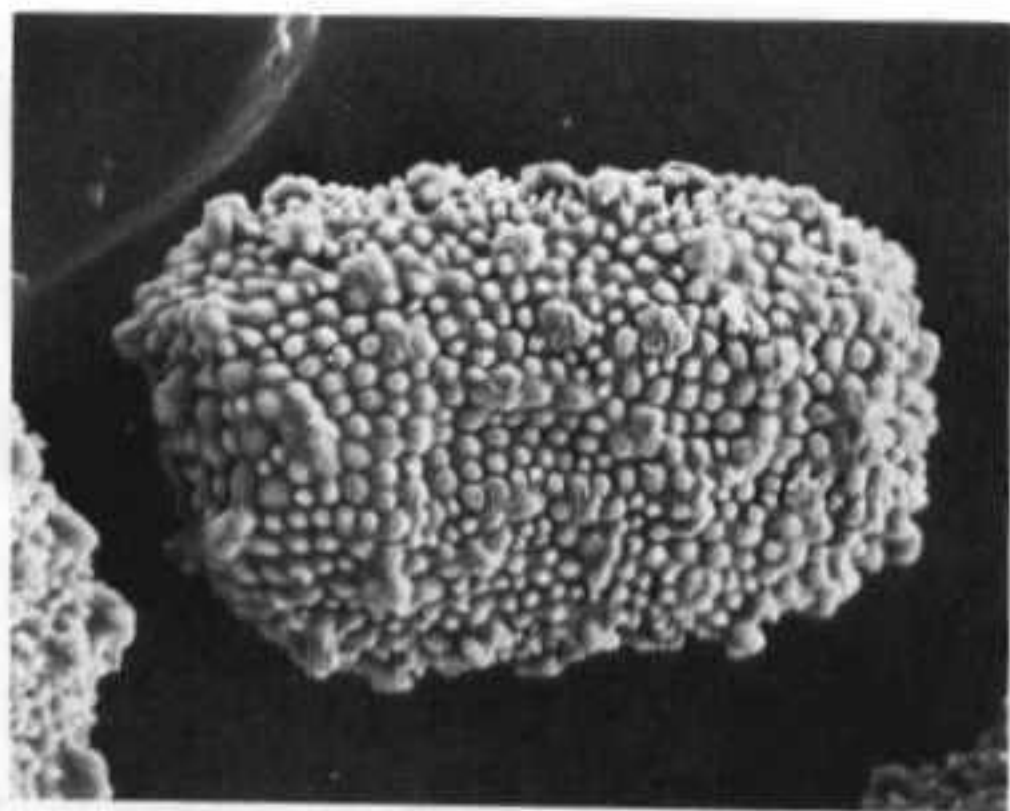


Fig. 6. Seeds of *Kieckxia* photographed with scanning electron microscope. Above. *K. acerbiana* near Qumran, Dead Sea area. $\times 165$. Below. *K. aegyptiaca* ssp. *palaestina*, from 25 km NE of Nablus, $\times 55$.

K. judaica, differs from the new species in many characters. It is a stiff spinescent dwarf shrub with indehiscent capsules containing 2-4 seeds three times as large as those of *K. judaica* (Figs. 5 & 6). The diaspore of *K. aegyptiaca* is the entire intact capsule and the seeds are sculptured in a different pattern (Fig. 6). It occurs in more humid areas than the other species (Fig. 4.)

APPENDIX

SELECTED SPECIMENS OF RELATED SPECIES

Specimens are deposited in the herbarium of the Hebrew University, Jerusalem (HUJ), unless otherwise stated.

Kickxia acerblana (Boiss.) Taeckh. & Boulos, Publ. Cairo Univ. Herb. 5:98 (1974). Israel: Dead Sea area: near Qumran 25.VI.1976, *Danin*; Negev: Wadi Kurnub, 26.XII.1942, *Feinbrun*; near Elat, 22.III.1965, *Lipkin*. N Sinai: G. Halal, 23.IV.1975, *Danin*. S Sinai: Mirdag des Wadi Timan, 21.IV.1904, *Kneucker* (Type of *Linaria kneuckeri* Z!). Egypt: N Galala, Wadi Nooz, 27.III.1944, *Shabetai*.

Kickxia macilentata (Decne.) *Danin* in *Danin & Hedge*, Notes Roy. Bot. Gard. Edinb. 32: 265 (1973). The following are additional specimens to those previously listed. S Sinai: near St. Katherine's Monastery, 6.IV.71, *Danin*, Gebel Umm S'omar, 2,000 m, 26.IV.68, *Danin & Shmida*.

Kickxia aegyptiaca (L.) Nabelek subsp. *palaestina* (Bornm.) *Feinbr.*, Israel J. Bot. 70: 31 (1976). Esdraelon Plain: between En Harod and Tel Yosef, 4.IV.1924, *Eig & Faktorovskyi*; Jordan Valley: Tiberias, 19.III.1929, *Gabrielith*; Wadi 'Auja, near 'Ein el 'Auja, 16.V.1973, *Danin*; near Jericho, 8.IV.1934, *Eig, Feinbrun & Zohary*.

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