Claytonia linearis Dougl. (*Montia linearis* (Dougl.) Greene) in Poland

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Abstract

Claytonia linearis, an ephemerophyte hitherto not known to occur in Poland, was found in the Czachówek region. Its morphological description, data on the occurrence of this species in Poland and in its native habitat are given.

Key words: *Claytonia linearis*, ephemerophyte, pollen, seeds

In 1988 I found profuse occurrence of *Claytonia linearis* in the vicinity of Czachówek (Fig. 1). This species (*Portulacaceae*) is not noted in the recently published list of ephemerophytes occurring in Poland (Rostański and Sowa 1987). Information obtained from more than ten of the main herbariums of Poland indicate that this may be the only finding of *Claytonia linearis* in our country.

The stands found near Czachówek were about 300 m south of the locality Czarny Las, 30 to 40 m from the railroad tracks on the G. Kalwaria-Czachówek line. They were mainly on fields of grain crops and on pastures having draining ditches. This species occurred particularly numerously among grains on sandy soil with a rather high water level. They grew here to about 20 cm in height and outnumbered all of the other species, even the cultivated ones. It grew equally abundantly near a draining ditch where, in contrast to the those among grain crops, (poorly branched, tall and straight stems), the shoots were intensely branched and short, about 8 cm in height. In addition to stands from damp sites, *C. linearis* also occurred in dryer ones along with *Teesdalea*

Fig. 1. x — small group of plants. x with arrow(s) — large group of plants with direction of expansion indicated

nudicaulis (L.) R. Br., *Veronica dillenii* Cr., *Spergula vernalis* Willd., *Myosotis micrantha* Pall., *Scleranthus annuus* L. and others. It also occurred along the sides of paths, which was most likely the result of seeds being carried along in the spring and autumn on the wheels of agricultural machinery. Another reason for the significant development of this species is its ability to develop seeds for a considerable period after being pulled out of the ground (eg. as the result of weeding). In addition to the sites mentioned above, several specimens were found in a small wooded area among fields. No plants of the species under discussion were found penetrating natural communities.

The genus *Claytonia* had been represented in Poland by the species *C. perfoliata* Don. carried into the vicinity of Szczecin (Ćwikliński 1970) and also reported by Schube from Wrocław (Rostański and Sowa 1987). *C. perfoliata* significantly differs from *C. linearis* by the presence of five stamens and large, plate-like perifloral leaves. The presence of three stamens in *C. linearis*, characteristic for the *Pseudo-Claytonia* von Poellnitz section (Poellnitz 1932) makes easy identification of this species possible.

This species originates from western North America. It is found from British Columbia (Babine — 55 N) (Scoggan 1978) to California through to eastern Montana and Yellowstone (Poellnitz 1932). It occurs mainly in damp stations, less frequently in dryer ones. It is found, eg. on the prairies of the Pacific coast, grassy river plains, mountain peaks, muddy river banks and ponds, dried fields (Poellnitz 1932). It is reported from river valleys and mountain foothills mainly on sandy soils with various water levels (Hitchcock and Cronquist 1964, Scoggan 1978).

The natural stands of about 30 species of this genus are limited to the pacific regions of North America (Pax 1894, Poellnitz 1932, Engler 1964, Takhtadzhian 1980), where most of the species occur. Only *C. virginiana* L. and *C. caroliniana* Mich. are found in the Atlantic regions. Representatives of this species are also found in Central America, Australia and Siberia, sometimes showing a significant distribution (*C. perfoliata* Don: Cuba, Alaska — Pax 1894). *C. perfoliata* Don., *C. sibirica* L. and *C. virginiana* L. are cultivated in botanical gardens (Pax 1894).

Retracing the migration route of *C. linearis* is difficult. It seems most probable that the seeds were spread in association with railroad transportation (the USSR-West Europe railroad line). Taking into account the thousands of specimens of this species found that have probably been growing in these stands for several years and the fact that differentiated stands have been found, *C. linearis* will probably not remain classified as an ephemerophyte, but has a chance of becoming permanent on these stands, mainly in the segetal communities.

It is probable that *C. linearis* will be brought along into other regions of this country and that it will also spread locally as well. Its pollen will probably be present in subfossil sediments and it is therefore necessary to give a short description of the plant and its pollen.

This is an annual plant that has tiny, thread-like roots (Fig. 2). The stem is bare, is either branched or unbranched from the base, reaching up to 20 cm in length. The leaves are alternate. Lateral stems grow out of leaf corners and often reach lengths equivalent to that of the main shoot. Leaves are up to 5 cm long and 1-2 mm wide, single veined and lanceolate, sessile. Inflorescences are positioned apically on stems in angles bracts that are membranous, rounded and suddenly acute, encompassing the axis of the inflorescence. The single flowers are alternate, on stems up to 1.5 cm long. There are two calyx sepals, about 4 mm long with overlapping edges, green, white-rimmed, roundish (Fig. 3). The flowers have 5 white petals that are not fused at their bases. Three of the petals are smaller and have thread-like stamens fused to them basally. The petals are 4-6 mm, wedge shaped. There are 3 stamens one pistil with 3 stigmas. The fruit is a three-seed sac, opening with three flaps. The herbarium specimen on which this description is based is kept in the Herbarium of the Department of Plant Classification and Geography of the University of Warsaw (herbarium sheet no. 73058).

Fig. 2. *Claytonia linearis* — overall appearance

Fig. 3. Flower structure: a — general appearance, b — corolla petal (larger), c — corolla petal with fused stamen, d — calyx sepal with immature sac

The seeds of *C. linearis* (Fig. 4) correspond with the characteristics given for several species of *Claytonia* (Kowal 1961). The plane in which the cotyledons of the embryo come into contact is parallel to the plane of symmetry of the seed. The edge above the hypocotyl is incised perpendicularly

to the long axis of the seed, with a fragment of the funicle in the incision. The dimensions of the seed (in mm): ($N = 25$): length — 1.62-(mean 1.96)-2.06, width — 1.44-(mean 1.73)-1.85, thickness — 0.76-(mean 0.93)-1.03, width to length ratio, 0.84-0.92. Black in colour. Seeds shiny. Wide elliptic outline. Lens-shaped with two equally convex sides. The seed edge sharp, with a keel distinctly visible on one side. The seed sculpture is formed by multifaceted cells having slightly convex and smooth external walls. The shape of the external cell walls becomes elongated on the keel, forming a several-rowed palisade.

Fig. 4. Seed

Pollen grains (Fig. 5) are round in outline (pericolpata), made up of about 16-20 penta- and hexagonal segments bordered with colpi. On each segment there is a convex area 10-12 in height. Apertures are formed by 5 or 6 short colpi surrounding each segment and connected with each other. This causes the pollen to fall apart into individual sections upon maceration. The colpus lacks costae colpi, the ectexine does not have margo. The colpus is narrow often interrupted. The ornamentation differs significantly on the convex part and at the base of a segment: the ornamentation of the raised part — psilata, perforata, echino-baculata (echinae triangular in cross-section, 2-3 μm in height). The base of a segment has tecum perfossulatum, partly perforatum. The columellae increase in height as they near the raised part. There they also branch more frequently and suddenly disappear on the slopes of the raised part where the sexine seems to be made of a homogeneous layer. The raised part is probably made of a layer of sexine separated at its base from nexine. That is why there is an empty space under the raised part, delineated from below by nexine. The wall thickness at its thinnest part (around the colpi is difficult to measure precisely without cross-sectioning, but is about μm . The size of the grains is about 62 μm (60-73 μm).

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Fig. 5. Pollen grain, scanning electron micrograph: c, b — pollen grain surface (focused on colpi); a — pollen grain surface (focused on the raised part); d — inner view ($\times 15\,000-30\,000$)

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Claytonia linearis Dougl. (*Montia linearis* (Dougl.) Greene) w Polsce

Streszczenie

W 1987 roku stwierdzono występowanie północnoamerykańskiego gatunku z rodziny *Portulacaceae* — *Claytonia linearis*, w Polsce. W swym naturalnym zasięgu pojawia się on w pacyficznych obszarach Ameryki Północnej (Bryt. Kolumbia-Kalifornia). Nie był on prawdopodobnie nigdy notowany w Polsce. Stanowiska stwierdzone w okolicach Czachówka występują przede wszystkim w uprawach zbożowych, ale także na łąkach i przydrożach. Najliczniej rozwija się on na glebach o wyższym poziomie wód gruntowych. Gatunek łatwo odróżnia się od ok. 30 gatunków tego rodzaju obecnością trzech pręcików, a także pokrojem — roślina roczna o nitkowatych korzeniach, liściach równowąskolancetowatych, płatkach białych (trzy mniejsze z przyrośniętymi pręcikami, dwa większe). Nasiona spełniają charakterystykę podaną dla kilku innych gatunków rodzaju (Kowal 1961). Ziarna pyłku o pokroju kulistym złożone z kilkunastu segmentów, ograniczonych bruzdami.