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SVETLANA S. BEER (PANKOVA) & OLGA N. DEMINA

A new species of *Salicornia (Chenopodiaceae)* from European Russia

Abstract

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Salicornia heterantha is described as a new species from the Rostov province in SE European Russia. It differs from other species of *Salicornia* by (1) the central flower of the dichasia being fused to the main axis of the spike, and (2) the comparatively long anthers in combination with short inflorescences. Only two localized populations are known, from saline clays on the banks of a salt lake. *S. heterantha* shows a peculiar heterocarpy: fruits of lateral flowers are dispersed freely while the fruit of the central flower remains fixed to the spike.

During field studies in the Rostov province, SE European Russia, in 2003, we found two populations of *Salicornia* that neither match the descriptions of taxa known from that area (Tzvelev 1996) nor from other regions of Europe (e.g., Ball & Akeroyd 1993, Davy & al. 2001, Lahondère 2004, Stace 1997), Turkey (Ball 1967) and the neighbouring Middle East (Hedge 1997). Detailed morphological investigations revealed that these plants represent a new species.

The genus *Salicornia* is characterized by flowers arranged in typically three-flowered cymes (dichasia) aggregated in spike(s). The flowers of a cyme are unequal: the central flower is large and has four tepal lobes while the two lateral flowers are significantly smaller and have mostly only three tepal lobes. As far as we know, in all previously described *Salicornia* species, the flowers of a cyme are free from each other and the spike axis (e.g., Ball 1967, Ball & Akeroyd 1993, Tzvelev 1996, Stace 1997, Lahondère 2004, Davy & al. 2001). However, in the species newly described here the perianth of the central flower of a cyme is fused with the spike axis, while the two lateral flowers are free. In addition to its unusual inflorescence structure, the new species differs from other Russian *Salicornia* species in a combination of long anthers and comparatively short spikes. It has the longest anthers among all *Salicornia* species reported from European Russia and its range of anther length only slightly overlaps with the range of anther length measured in the species group of *Salicornia dolichostachya* Moss. In spike length (3.5-4 cm), the new species resembles *S. europaea* L. and *S. perennans* Willd.

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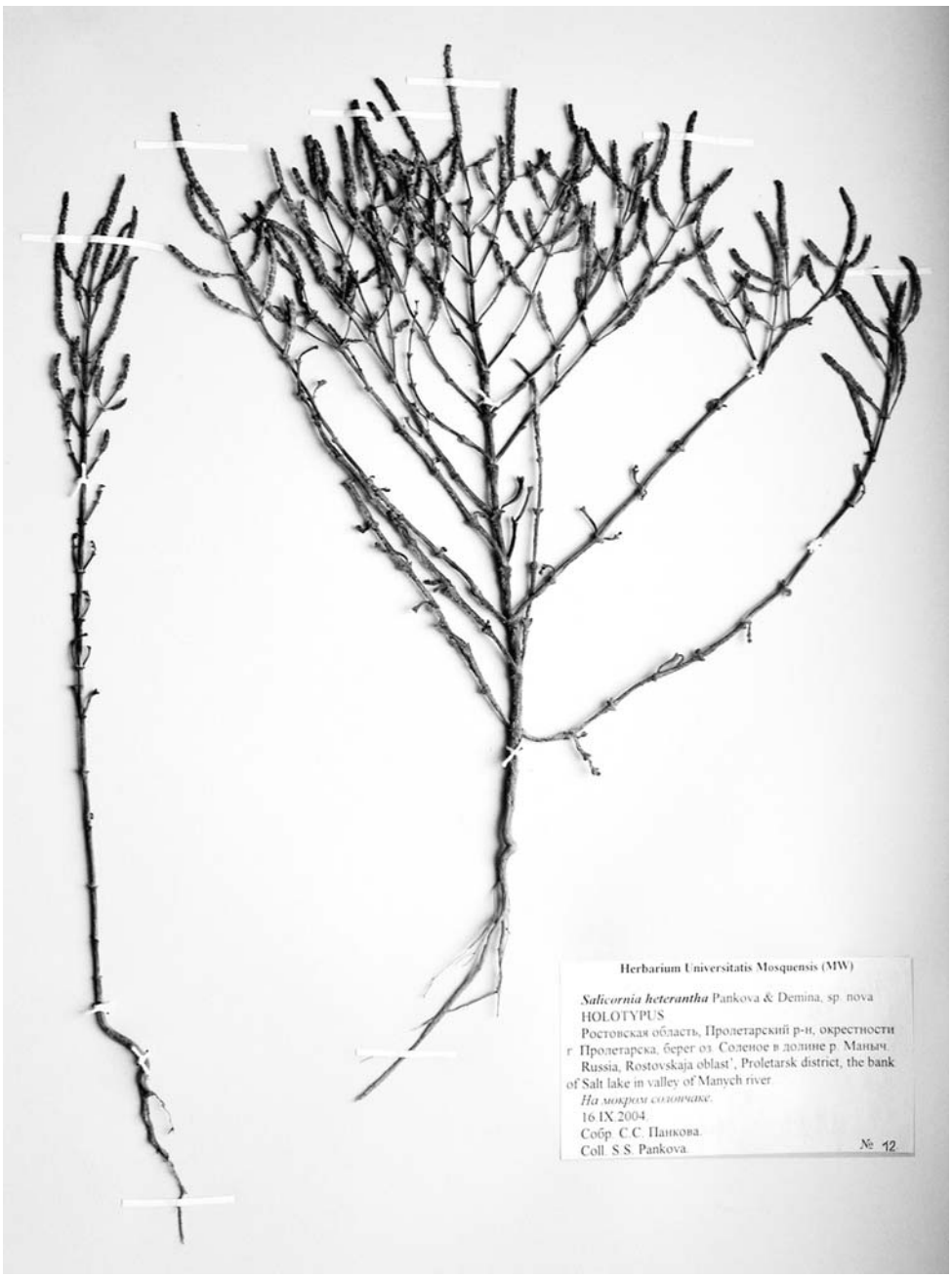


Fig. 1. *Salicornia heterantha* Beer & Demina (holotype MW).

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Salicornia heterantha S. S. Beer & Demina, **sp. nov.**
Holotype: Russia, Rostov province, Proletarsk district, bank of salt lake in valley of Manych river [47°19'N, 41°44'E], 16.9.2004, *S. S. Pankova 12* (MW; isotypes: B, KAS, LE, MHA, MJG, MW) – Fig. 1, 3.

A species proxima *Salicornia perennans* Willd. floribus centralibus inflorescentiae axi perfecte adnatis (nec liberis) et antheris 0.7-1.1 mm (nec 0.3-0.5 mm) longis differt.

Annual, 12-30 cm tall, green when young and yellowish red by the end of vegetation period. *Root system* with main root usually not exceeding 7-10 cm and well developed lateral roots. *Shoots* branched up to the fourth order, the lower branches poorly developed, the others diverging in acute angles and directed upwards with their tips in one level; main shoot with 10-23 sterile segments, the lower becoming covered with a periderm by the middle of vegetation period. The rim-like remnants of fused opposite leaves 0.2-0.7 mm long with a hyaline margin less than 0.1 mm wide. *Spikes* (1.5-)3.5-4(-7) cm long; fertile segments usually 11-15, with convex sides, (0.2-)0.3(-0.35) cm long and 0.3-0.4 cm wide in the middle (Fig. 3A-B). *Flowers* arranged in 3-flowered cymes; perianth of central flower with 4 lobes up to 0.2 mm long, the tube completely fused to the spike axis without visible border (Fig. 3A-B); perianth of lateral flowers with 3 lobes 0.1-0.2 mm long, the tube free from the axis, 0.7-1 × 1.2-1.4 mm at anthesis. *Stamens* in median position; anther of upper stamen (0.7-)0.8(-1.1) mm long, slightly larger than in the lower; filaments up to 0.4 mm long. *Ovary* with one basal ovule; *stigma* up to 0.5 mm long, papillose; *pericarp* membranous, of transparent cells. *Seeds* flattened, horseshoe-shaped, light brown, (0.9-)1.2 (-1.4) mm long, one side (from the direction of the root) loosely covered by hooked hairs (Fig. 3C).

Habitat and distribution. – Only two localized populations are known from the outskirts of Proletarsk city, Rostov province (Fig. 2). There, *Salicornia heterantha* inhabits dense, saline clays on the banks of a shallow lake that dries up at the end of the summer. One of the populations forms monospecific stands, while the other grows in a community with *S. perennans.* The

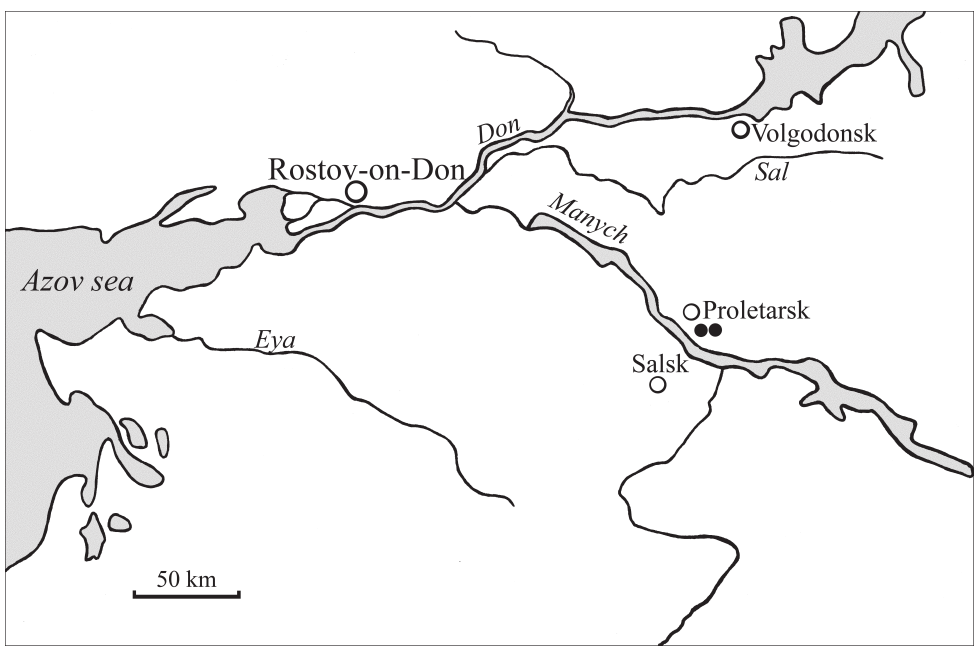


Fig. 2. Known distribution of *Salicornia heterantha* Beer & Demina (●).

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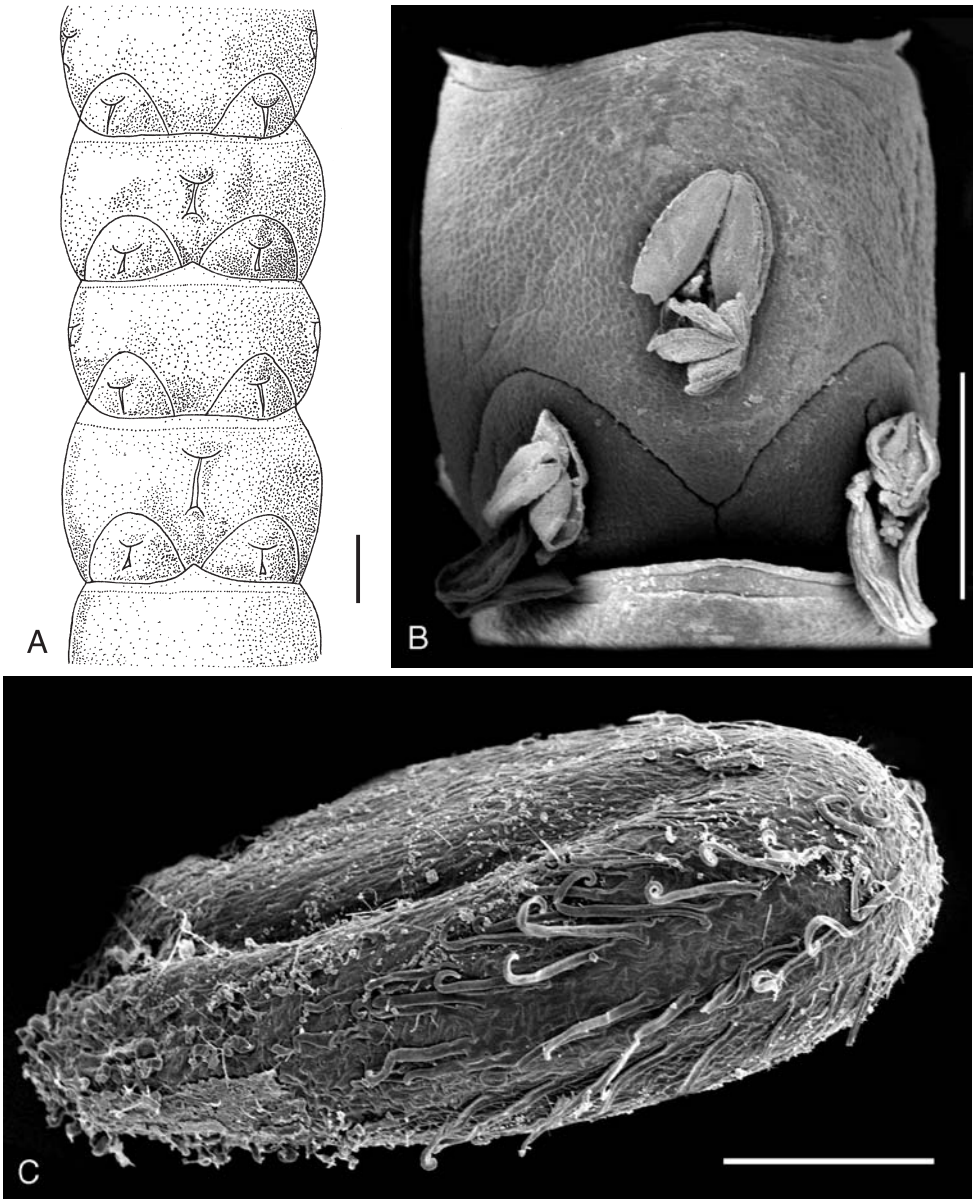


Fig. 3. *Salicornia heterantha* – A: part of spike showing four 3-flowered cymes (dichasia); B: SEM photograph of a 3-flowered cyme; C: SEM photograph of a seed, seen from the root side. – Scale bars A-B = 1 mm, C = 200 µm.

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Manych river valley is very interesting in botanical and geographical respect. It is located at the boundary of two different steppe provinces (Pontic and Trans-Volga-Kazakhstan), where arid and humid floristic elements overlap. The territory has been exposed to sea transgression at the end of the Tertiary and during long periods of the Quaternary. After sea regression, the formerly barren area may have offered a great number of empty niches for colonizing taxa and speciation (Minoransky & Demina 2002).

Additional specimens. – Type locality, 23.9.2003, *S. S. Pankova 11* (MW).

Features of seed dispersal. – Mature fruits of lateral flowers are dispersed together with the enclosing perianth. In contrast, the fruit of the central flower remains fixed to the spike. Apparently these seeds germinate only after the spikes have broken down and came into contact with the soil. This mode of atelechory enables the species to stay in a once occupied locality. A similar type of heterocarpy is known from *S. pusilla* J. Woods (Dalby 1963). Other *Salicornia* species show seed dimorphism (Davy & al. 2001).

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References

Ball, P. W. 1967: *Salicornia*. – Pp. 321-323 in: Davis, P. H. (ed.), Flora of Turkey and the East Aegaean Islands **2.** – Edinburgh.

— & Akeroyd, J. R. 1993: *Salicornia.* – Pp. 121-123 in: Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (ed.), Flora europaea, ed. 2, **1.** – Cambridge, etc.

Dalby, D. H. 1963: Seed dispersal in *Salicornia pusilla*. – Nature **199:** 197-198. [CrossRef]

Davy, A. J., Bishop, G. F. & Costa, C. S. B. 2001: *Salicornia* L. (*Salicornia pusilla* J. Woods, *S. ramosissima* J. Woods, *S. europaea* L., *S. obscura* P. W. Ball & Tutin, *S. nitens* P. W. Ball & Tutin, *S. fragilis* P. W. Ball & Tutin and *S. dolichostachya* Moss). – J. Ecol. **89:** 681-707.

Hedge, I. C. 1997: *Salicornia* L. – Pp. 130-131 in: Rechinger, K. H. (ed.), Flora iranica **172.** – Graz.

Lahondère, C. 2004: Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A. J. Scott et *Arthrocnemum* Moq.) sur le côtes françaises. – Bull. Soc. Bot. Centre-Quest, ser. 2, num. spéc. **24.**

Minoransky, V. A. & Demina, O. N. 2002: Osobo ohranyayemye prirodnye territorii Rostovskoy oblasti [Particularly protected natural territories of Rostov province]. – Rostov-on-Don.

Stace, C. 1997: New flora of the British Isles, ed. 2. – Cambridge, etc.

Tzvelev, N. N. 1996: *Salicornia*. – Pp. 73-74 in: Tzvelev, N. N. (ed.), Flora Vostochnoy Evropy [Flora Europae orientalis] **9.** – St Petersburg.

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