

Luronium – 2013



2.1. Latinsk navn (Latin name)

Luronium natans (L.) Rafin.

***Luronium natans* growth forms and Metodology.**

According to the English botanical literature, *Luronium natans* has two distinct forms: *submersum* - with submerged linear-lanceolate leaves, which are flat and only grow in water, and *repens* - with “expanded” leaves. Expanded leaves have petioles and blades, and may float or be submerged (WILLBY & EATON 1993, LANSDOWN & WADE 2003). Thus, the division line is between forms having only submerged leaves and forms having both submerged and expanded floating leaves. Forms growing on the not flooded, exposed substrate, are not described in details.

In turn, in Polish botanical literature (f.e. SZMEJA 2001) there are described two forms either. The division line is between submerged plants (even they have expanded floating leaves) and terrestrial forms. The latter grow on the exposed substrate, not in the water, and they have aerial ovate leaves, sometimes with remnants of a rosette of submerged leaves. However, the causes of variation in growth form are apparently environmental rather than genetic, and these forms are not consistent.

So, we distinguish three forms for the purposes of this study - it makes it easier to inventory *Luronium* in the field and better shows the diversity of the population of this plant in the area of research although these forms are often a continuum in space or in time:

- (i) **Submerge vegetative form** - completely submerged form with rosettes of linear-lanceolate leaves connected with white or green stolons but without “expanded” floating leaves. It occurs in deeper water – one to several meters.
- (ii) **Submerge form with floating leaves** - form with submerged leaves rosettes, stolons and with “expanded” floating leaves (elliptical to ovate, on long petioles which grow out of underwater leaves rosette); white flowers (~1 cm of diameter) occur on the water surface (on long pedunculates); forms grow in not very deep water, usually up to 1 m depth.
- (iii) **Terrestrial form** - with “expanded” aerial leaves, elliptical to ovate shape, on short petioles, sometimes with white flowers; they occur on exposed muddy bottom or in not very deep water (up to several centimeters).

2.2 Rødlistestatus (redlist status)

Sårbar. (Vulnerable)

2.3 Utbredelse (spreading/place)

Luronium natans is an European endemic. It occurs in Western and Central Europe, southern part of Scandinavia, in the range of the Atlantic and Subatlantic climate. The Oslo populations seems to be the northernmost in the whole range (and the only natural sites in Norway). The main range of distribution of this plant is Western and Central Europe, including Poland.

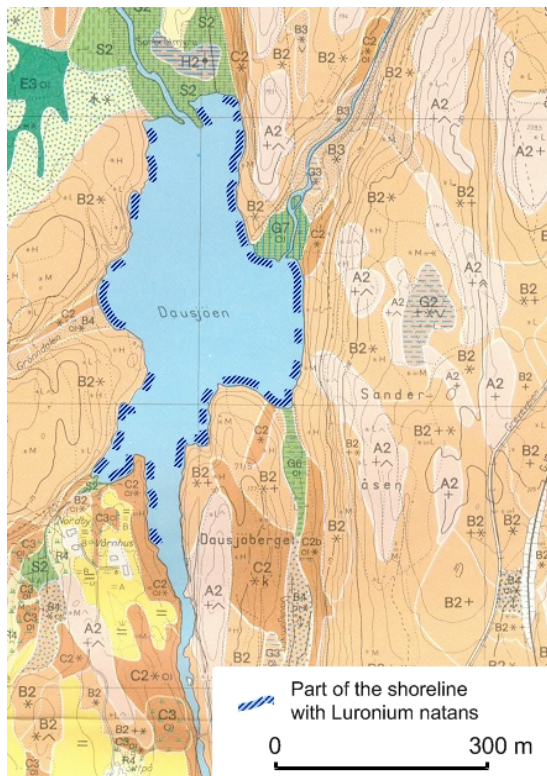
2.4 Lokalteter i Norge (locations in Norway)

"Flytegro (*Luronium natans*) vurderes som sårbar (VU) fordi den bare er sikkert dokumentert fra fem små vatn innen to 4-km²-ruter, og fordi antall reproduktive individer fluktuerer sterkt. Flytegro er belagt i de offentlige herbariene fra Ak Oslo: Maridalen: Alnsjøen (1923-1978), Svartkulp (1948-2002), Breisjøen (1949-2002), Dausjøen (1995), og ei vik i Maridalsvatnet (1996-2009). Mye tyder på at den er kommet inn, trolig med fugl, til Alnsjøen tidlig på 1900-tallet og har spredt seg videre derfra. Forekomstene i Nordmarka synes stabile og er pr. idag ikke utsatt for negative påvirkningsfaktorer, men bestandene har store fluktuasjoner. I tillegg er arten rapportert fra Øf Fredrikstad: Roppestaddammen i 2009, men der som innplantet. En rapport fra Ak Oppegård i 1999 er ikke bekreftet, og en fra Vf Larvik bygdte på feilbestemt materiale. Flytegro ser ut til å være lite påvirket av den tidligere drikkevannsreguleringen i Breisjøen, og den nåværende i Maridalsvannet. Arten omtales med kart hos Fægri & Danielsen (1996)." - Text from: Norsk_rødliste_for_arter_2010_pjuZH.pdf

2.4.1. Lokalteter i Oslo (locations in Oslo)

5 known locations (Alunsjøen, Breisjøen, Dausjøen – confirmed by our researches in years 2008 – 2013. and Maridalsvannet, Svartkulp – **confirmed! this year - 2013**).

Location: 1. DAUSJØEN



Observations were made only from a shore, in eastern part of a lake! Plants could be observed only to the water depth of about 1.5 – 2 m and 3 – 5 m from the shoreline. *Luronium* can grow deeper- down to 3 m deep, but this area could not be examined from the shore (a boat is necessary).

Individuals: Very abundant, sometimes as many as 200 individuals / 1m². If we estimate: 10 individuals /m² and 2000 m of shoreline x 3 m wide belt of occurrence = 60 000 (for 200 individuals / 1m² = 1 200 000) individuals, or more.

Area: We estimate that *Luronium* is present on 60 – 70% of the lake shoreline. It grows more often on the Eastern side of the lake with the exception of a steep cliff in the southern part. It does not grow only in shallow, very muddy bays and in places where the water is immediately very deep. See the map.

Environment (habitat): Lake with stable water level. Plants prefer the depths between 10 - 100 cm. At that depth floating leaves can be visible. *Luronium* grows preferably on empty sandy bottom with a thin layer of organic sediment, but also together with: *Lobelia dortmanna*, *Juncus bulbosus*, *Equisetum fluviatile*, *Carex vesicaria*, *Lysimachia thyrsiflora*, *Alisma plantago-aquatica* (rarely), *Nuphar luteum*

Condition: Submerge vegetative form have been noticed in few chosen places in the same quantity as last years. Not very much (but more than last year) floating leaves has been noticed close to eastern shore on very shallow water (0 - 20cm) and no flowers at a date of observation.

Care:

GPS-coordinates: 60° 0'31.70"N 10°47'23.08"E

[Luronium-Dausjoen1](#)

Date of watch: 20.07.2013

Owner:

Photos: R. Gramsz

Observer: R. Gramsz, J. Potocka.

Phot.1. Part of a SE shoreline with *Luronium*. 20.07.2013



Phot.2. Floating on a surface few *Luronium* underwater rosettes still connected together with green stolon on a background of underwater *Luronium* meadow. 20.07.2013



Phot.3. Abundant underwater *Luronium* meadow. 20.07.2013



BREISJØEN , ALUNSJØEN, SVARTKULP.



Location: 2. BREISJØEN

Observations were made only from the shore!

Individuals: Abundant

Area: *Luronium* is present on ca. 50% of the lake shoreline. It does not grow only in shallow, very muddy bays and where the water is immediately very deep. Also there is lack of *Luronium* close to the dam in Eastern part of a lake. See map.

Environment (habitat): This lake has variable water level. Plants can grow both on the expose shore and submerge in water. The highest concentration is observed along water depth of about 1m below maximum. *Luronium* grows preferably on empty sandy bottom, but also together with: *Lobelia dortmanna*, *Juncus bulbosus*, *Ranunculus reptans*, *Isoëtes echinospora* (?), *Equisetum fluviatile*, *Carex vesicaria*, *Lysimachia thyrsiflora*.

Condition: This year two forms of *Luronium* were found: 1. Submerge vegetative form. 2. Submerge form with floating leaves. Terrestrial form has not been found this year as the water level was at maximum at a date of observation. The plants bloomed profusely in all places known from last years.

Care: !!! – It will be very interesting to know (if it exists – data from limnigraph) the record of water level changes during as many years as possible.

GPS-Coordinates: 59°58'47.17"N 10°51'38.11"E

[Luronium-Breisjoen2](#)

(See the map. Map datum (Kartdatum): WGS 84; Position format (Posisjonsformat): UTM UPS) GPS 1: 0603737/ 6650352; GPS 2: 0603700/ 6650374; GPS 3: 0603661/ 6650387; GPS 4: 0603616/ 6650450; GPS 5: 0603672/ 6650527; GPS 6: 0603661/ 6650635

Date of watch: 18.07.2013

Owner:

Photos: R. Gramsz, J. Potocka

Observer: R. Gramsz, J. Potocka

Phot.1. Brejsjøen with maximum level of water. (phot. R.G.) 18.07.2013



Phot.2. Lot of floating leaves and very abundant flowering this year. (phot. J.P.) 18.07.2013



Phot.3. *Luronium natans* in Breisjøen. Floating leaf and flower. (phot. R.G.) 18.07.2013



Location: ~~3. ALUNSIJOEN~~

Individuals: Not found

Area: 2 places in small bays in Eastern and Southern part of a lake.

Environment (habitat): This lake is with variable water level. Plants grows in a very shallow, both standing and flowing water in places where flow in streams forms pools still full of water. During maximum water level in the lake this places are submerged.

At a day of observation the lake water level was at maximum. That means, it was 1 – 2 m of water over usually dry bottom of a bays were *Luronium* plants has been recently found.

With other plants:

Site 1. in water- *Alisma plantago-aquatica*, *Glyceria fluitans*, *Hippuris vulgaris*. On shore- *Carex lasiocarpa* (dominant), *Carex stellulata*, *Carex rostrata*, *Carex vesicaria*, *Comarum palustre*, *Epilobium palustre*, *Equisetum fluviatile*, *Galium palustre*, *Juncus bufonius*, *Lysimachia thyrsiflora*, *Menyanthes trifoliata*, *Peucedanum palustre*, *Polygonum minor*, *Ranunculus reptans*, *Rorippa palustris* cfr., *Sphagnum squarrosum*, *Veronica scutellata*

Site 2. in water- *Alisma plantago-aquatica*, *Alopecurus aequalis*, *Glyceria fluitans*, *Juncus bufonius*, *Rorippa palustris* cfr.,

Condition: In so high level of water it was not possible to find *Luronium* but we hope that it still subsist in those places.

Care: !!! – It will be very interesting to know (if it exists – data from limnigraph) the record of water level changes during as many years as possible.

GPS-coordinates: 59°57'57.94"N 10°51'4.54"E

Site 1. 59°57'50.45"N 10°51'18.85"E

Site 2. 59°57'41.56"N 10°51'5.12"E

[Luronium-Alunsjoen3](#)

[Luronium-Alunsjoen3.1](#)

[Luronium-Alunsjoen3.2](#)

Date of watch: 19.07.2013

Owner:

Photos: R. Gramsz

Observer: R. Gramsz, J. Potocka

Phot.1. Alunsjoen, location 1 with maximum water level in the lake. 19.07.2013



Phot.2. Alunsjoen, location 2 with maximum water level in the lake. 19.07.2013



Location: 4. SVARTKULP

Observations were made only from the shore!

Individuals: 1 flower and few submerged rosettes in Northern shore have been surely determine as *Luronium* (phot.1, 2.) and few spots with only submerged rosettes notice from a distance most likely was *Luronium* (see phot.3.) Those spots cover ca. 10% of shoreline.

Area: *Luronium* is spread (probably) on ca.10% of the lake shoreline. Does not grow on Western and North - Western muddy part of shoreline.

Environment (habitat): This lake has rather stabile water level. Is relatively small and surrounded by forest and high, steep rocks on Eastern side. Western and North - Western shallow shore is overgrown by mire vegetation. *Luronium* plants are growing preferably on empty sandy bottom, but also together with: *Nuphar luteum*, *Potamogeton natans*, *Juncus bulbosus*, *Equisetum fluviatile*, *Carex vesicaria*, *Lysimachia thyrsiflora*. *Sparganium* sp.

Condition: Submerge form with floating leaves has been found only in one small place on Northern shore. Submerge vegetative form has been found (probably) in few places on Eastern and South – Western shore usually at a depth of 20-100 cm.

Care:

GPS-Coordinates: 59°58'30.95"N 10°50'51.30"E

[Luronium-Svartkulp4](#)

Date of watch: 18.07.2013

Owner:

Photos: R. Gramsz

Observer: R. Gramsz, J. Potocka

Phot.1. View over Svartkulp from Northern shore. Ski stick points single Luronium flower.
18.07.2013



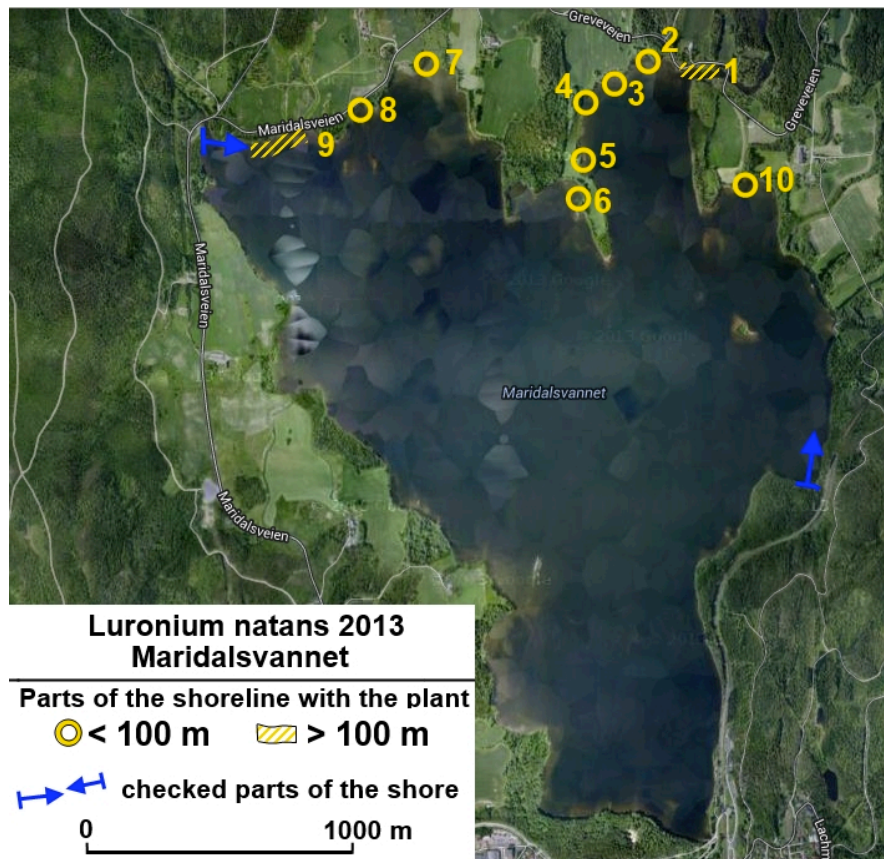
Phot.2. Luronium leaf rosettes. 18.07.2013



Phot.3. Underwater Luronium meadow with one taken from the bottom vegetative leaf rosette floating on surface of water. 18.07.2013



Location: 5. MARIDALSVANNET



Individuals: It is difficult to count *Luronium* individuals. The spots with *Luronium* we have found at Maridalsvannet are less abundant than in Dausjøen or Breisjøen and all 10 of them together cover not more than 600m of shoreline (we checked ca. 7 -8 km of North – Eastern shoreline of Maridalsvannet). It means that *Luronium* is grooving on ca. 8% of this part of Maridalsvannet shoreline.

Area: 10 different size spots which cover together about 600m of checked (7 -8 km) of North – Eastern shoreline of Maridalsvannet.

Environment (habitat): Big lake with variable water level. Surface of water in the lake can strongly wave because of its size. *Luronium* avoids exposure to waves and it is possible to find it only in sheltered bays, behind rocky spurs or protected against waving by other plants. Usually *Luronium* has been found at a depth of 30 to 150 cm (from maximum water level). With other plants: *Lobelia dortmanna*, *Littorella uniflora*, *Juncus bulbosus*, *Ranunculus reptans*, *Isoetes lacustris*, *Equisetum fluviatile*, *Carex vesicaria*, *Lysimachia thyrsiflora*, *Nuphar luteum*, *Potamogeton natans*, *Sparganium* sp.

Condition

If we consider the whole lake as the location – we can conclude that *Luronium* this year was in good condition: it has developed described three forms and it bloomed abundantly at many places. *Luronium* is a plant that is well adapted to changing water levels. The situation in

Maridalsvannet this year has shown that the lower level of the water (when *Luronium* can produce “terrestrial” forms) is better to observe this species than with high water level.

Observations were made only from the shore. The water level in Maridalsvannet was about **80 cm lower** than maximum. That situation gives possibilities to detect 10 places with *Luronium* along Northern shore of the lake from the mouth of Skjærsløelva to a small bay in the middle of Eastern shore. The rest of a shoreline has not been observed.



Site 1. A bay on the mouth of Skarselva from Dausjøen.

Coordinates: from 59°59'45.30" N, 10°47'11.10" E to 59°59'45.20" N, 10°47'16.60" E

[Luronium-Maridalsvannet5.1W](#)

[Luronium-Maridalsvannet5.1E](#)

Luronium natans grows on ca.100 m long Northern shoreline together with *Equisetum fluviatile*, *Carex vesicaria*, *Lysimachia thyrsiflora*, *Alisma plantago aquatica*, *Nuphar luteum*. Submerge form with floating leaves and few flowers and vegetative submerged rosettes were visible. Submerged vegetative forms are particularly abundant, up to tens (50-60) of ramets on 0.25 m² in areas not shaded by the leaves of *Nuphar*.

Site 2. N part of Nesbukta.

Coordinates: 59°59'46.80" N, 10°47'01.10" E

[Luronium-Maridalsvannet5.2](#)

Shallow place with *Equisetum fluviatile* and *Lobelia dortmanna*. Quite abundant with terrestrial form of *Luronium natans*. Site is about 20m long.

Site 3. NW part of Nesbukta between two rocky spurs, closer to Easter one.

Coordinates: 59°59'44.30" N, 10°46'53.60" E

[Luronium-Maridalsvannet5.3](#)

Only a few visible flowers and floating leaves but submerged rosettes under these floating leaves were visible too – so it is possible that this underwater "meadow" can be regarded as *Luronium natans* (to check with using a boat). With *Lobelia dortmanna*, *Littorella uniflora*, *Isoetes lacustris*, *Myriophyllum* sp.

Site 4. NW part of Nesbukta, between western spur and lake shore.

Coordinates: 59°59'41.10" N, 10°46'44.20" E [Luronium-Maridalsvannet5.4](#)

Abundant site with visible all tree forms of *Luronium* grooving on soft, exposed mud and not very deep in the water. Size of the largest compact patch: 6m x 15m (it occurs about 5 m from shore line of the most common maximum water level, between shore and patch of *Nuphar luteum*. With other plants: *Equisetum fluviatile*, *Lobelia dortmanna*, *Nuphar luteum*, close to reed *Phragmites australis* and sedge *Carex*. Site at least 50m long.

Site 5. Shore along Eastern part of peninsula.

Coordinates: 59°59'34.80" N, 10°46'43.40" E [Luronium-Maridalsvannet5.5](#)

Only several terrestrial forms of *Luronium* spread between *Equisetum fluviatile*, *Lobelia dortmanna*, *Phragmites australis*. Site about 50 m long.

Site 6. A sheltered bay in Western side of Nestangen.

Coordinates: 59°59'29.40" N, 10°46'43.60" E [Luronium-Maridalsvannet5.6](#)

Quite abundant site with 20cm current depth of water (80 – 100cm with a maximum level of water in the lake); about 15m x 20m. There have been a submerge form with floating leaves and flowers, forming a dense underwater “meadow”, growing together with *Nuphar luteum*, *Equisetum fluviatile*, *Lobelia dortmanna*.

Site 7. A bay East from church ruin in a mouth of small stream.

Coordinates: 59°59'45.90" N, 10°46'40.10" E [Luronium-Maridalsvannet5.7](#)

Only few terrestrial forms growing among *Equisetum fluviatile*, *Carex vesicaria*, *Carex gracilis* cfr.

Site.8. Small bay SW from church ruin, very close to road.

Coordinates: 59°59'40.50" N, 10°45'48.50" E [Luronium-Maridalsvannet5.8](#)

There were several little concentrations of *Luronium* with floating leaves and flowers (and submerged vegetative rosettes) on depth 20 -50cm (80 – 110cm at maximum water level). Together with *Lobelia dortmanna*, *Myriophyllum alterniflorum*.

Site.9. On Northern shore of Maridalsvannet close to mouth of Skjærsjøelva.

Coordinates: from 59°59'36.20" N, 10°45'24.30" E to 59°59'38.00" N, 10°45'36.40" E

Luronium-Maridalsvannet5.9W

Luronium-Maridalsvannet5.9E

The biggest (200m), continuous belt of shallow water with *Luronium*. Concentrations of *Luronium* floating leaves and flowers are spread among *Lobelia dortmanna*, *Myriophyllum alterniflorum*, *Littorella uniflora*, *Equisetum fluviatile*, *Potamogeton alpinus*, *Carex vesicaria*, *Phragmites australis*. Current depth of water was 0 – 50cm (ca. 40 – 100cm at maximum water level).

Site.10. Western part of a bay below Sander Farm, close to the mouth of small stream.

Coordinates: from 59°59'31.60" N, 10°47'23.70" E

Luronium-Maridalsvannet5.10

Terrestrial form and submerged form with floating leaves are spread on a location of size about 20m in diameter. Current depth of water 0 -20cm (30 – 100cm at maximum water level). Together with *Lobelia dortmanna*, *Juncus bulbosus*.

Care:

GPS-Coordinates: See site description.

Date of watch: 22 – 25.07.2013

Owner:

Photos: R. Gramsz, J. Potocka

Observer: R. Gramsz, J. Potocka

Phot.1. Site 1(left in the photo). Secluded bay with *Luronium* on the mouth of Skarselva (from Dausjøen) (phot. J. Potocka). 22.07.2013



Phot.2. Site 1 *Luronium* growing among *Nuphar*. (phot. J. Potocka). 22.07.2013



Phot.3. Site 2, exposed surface with terrestrial form of Luronium. (phot. J. Potocka). 22.07.2013



Phot.4. Site 2, terrestrial form of Luronium. (phot. J. Potocka). 22.07.2013



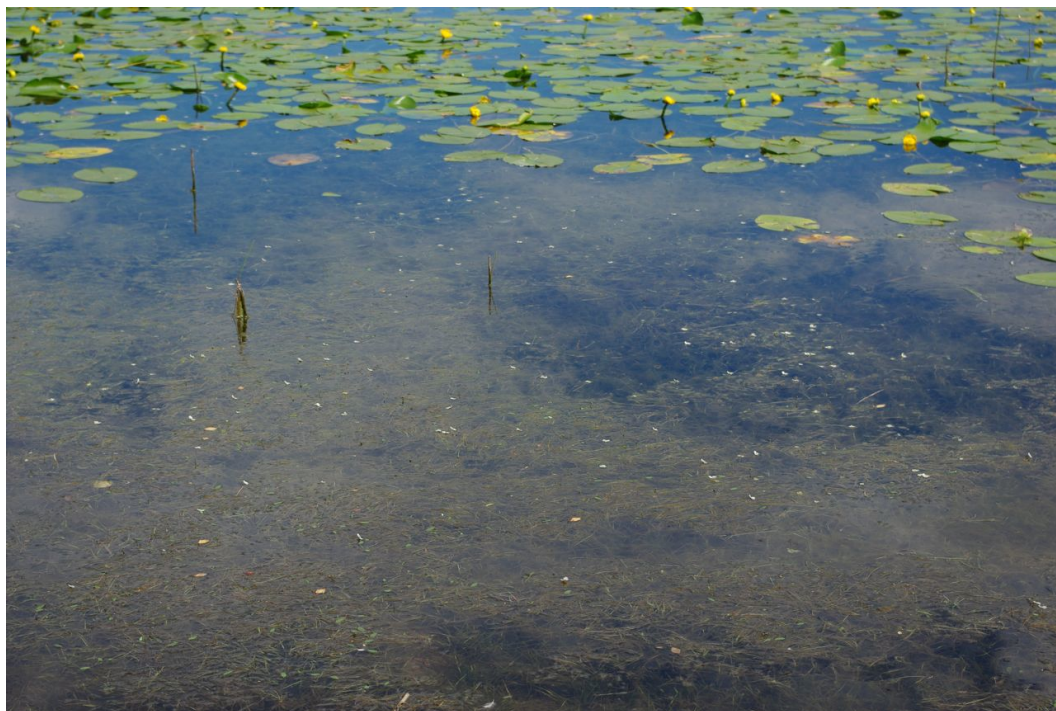
Phot.5. Site 3, Luronium occurs before the rock spur. (phot. J. Potocka). 23.07.2013



Phot.6. Site 4, Luronium stand in the bay sheltered by rock spur. (phot. J. Potocka). 23.07.2013



Phot.7. Site 4, abundance patch of *Luronium* occurs between the currently exposed banks and a patch of *Nuphar*. (phot. J. Potocka). 23.07.2013



Phot.8. Site 5, terrestrial forms of *Luronium* sparse grow in muddy ground on this site. (phot. J. Potocka). 23.07.2013



Phot.9. Site 6, Luronium position at the shallowness within Nuphar. (phot. J. Potocka).
24.07.2013



Phot.10. Site 6, Luronium underwater meadow, with a few floating leaves. (phot. J. Potocka).
24.07.2013



Phot.11. Site 8, Luronium patch is close to Maridalenveien (phot. J. Potocka). 25.07.2013



Phot.12. Site 9, Eastern part. (phot. J. Potocka).



Phot.13. Site 9, Luronium with floating leaves and flowers. (phot. R. Gramsz). 25.07.2013



Phot.14. Site 10, Western part of a bay below Sander Farm. (phot. R. Gramsz). 25.07.2013



Phot.15. Site 10, *Luronium* in currently shallow water. (phot. R. Gramsz). 25.07.2013



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