

NOBANIS - Invasive Alien Species Fact Sheet

Craspedacusta sowerbyi

Author of this fact sheet : Viktoras Didžiulis, Coastal Research and Planning Institute, Klaipeda University, Lithuania, H.Manto - 84, LT-91210, Klaipėda, phone: +370 46 380905, viktoras@ekoinf.net, <http://ekoinf.net>

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Species description

Scientific name: *Craspedacusta sowerbyi* Lankester, 1880, olindiidae.

Synonyms: *Craspedacusta sowerbii*, *Limnocodium victori*, *Limnocodium kawaii*, *Microhydra ryderi*, *Craspedacusta ryderi*, *Microhydra germanica*.

Common names: fresh water jellyfish (GB), gėlavandenė medūza (LT), Süßwasserqualle (DE), Sötvattensmanet (SE), Lammikokmeduusa (FI).

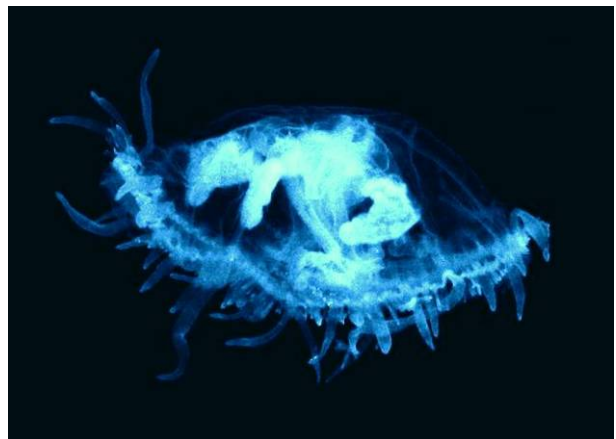
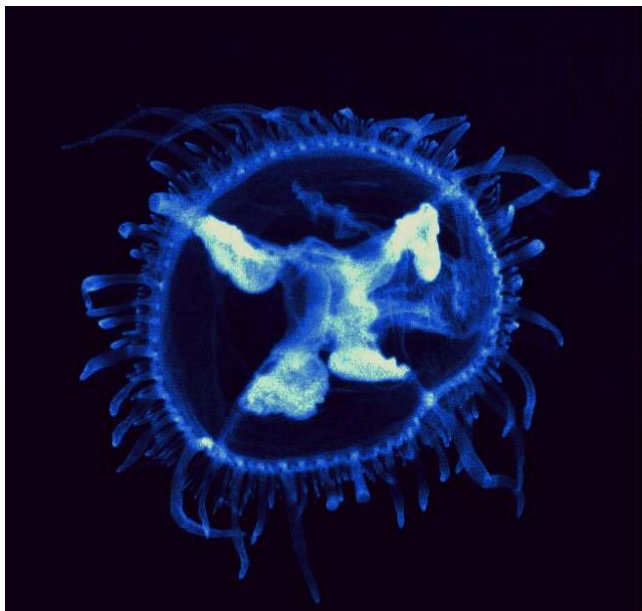


Fig 1. *Craspedacusta sowerbyi* from a gravel pit in Lithuania (photo by Virmantas Stunžėnas).

Species identification

Although several species within *Craspedacusta* have been described, only three species recently are considered to be certain (Jankowski 2001).

Individuals of this hydromedusa species usually appear in warm shallow pools as swarms of small jellyfish 5 to 25 mm in diameter. The hydromedusa is translucent with a whitish or greenish tinge (Peard 2005, Pennak 1989). It possesses four radial and one circular canal that form the gastrovascular cavity. The diameter of the circular canal is 5 to 22 mm. The tentacles are solid and vary in length. They are arranged in sets of three to seven short tentacles in between longer ones (Pennak 1989, Slobodkin and Bossert 1991). Shorter tentacles, with nematocysts, aid in capturing food and serve as a type of protection against predation, while the longer ones provide some stability when swimming. At the base of their tentacles, jellyfish have eyespots. Freshwater jellyfish has 4 very long tentacles, each parallel to a radial canal at the edge of the velum. The total number of tentacles varies from 50 to 500 (Pennak 1989). In addition to the hydromedusa, *Craspedacusta sowerbyi* appears in other microscopic forms such as podocyst, frustule, planula, and polyp (Acker and Muscat 1976). Two to four individual polyps can assemble in a colony 5 to 8 mm long (Pennak 1989).

Native range

All *Craspedacusta* species inhabit freshwater bodies of Eastern Asia (China and Japan). However, one species *Craspedacusta sowerbyi* Lankester, 1880, has expanded its home-range and currently has a worldwide distribution. This species has been detected in all continents except Antarctica (Dumont 1994). *C. sowerbyi* is indigenous to the Yangtze River valley in China. The hydromedusae appear frequently in shallow pools along the river. These pools experience fluctuating plankton populations, temperatures and water levels caused by conditions in the main river system. In the upper river valley, a second *Craspedacusta* species named *C. sinensis* coexists with *C. sowerbyi* (Slobodkin and Bossert, 1991).

Alien distribution

History of introduction and geographical spread

The first records were from water-lily tanks at Regents Park, London in 1880. Accounts of the Regents Park population were published simultaneously by Lankester and by Allman who named the specimens *Craspedacusta sowerbyi* and *Limnocodium victori*, respectively (Slobodkin and Bossert 1991). Also in 1880, a polyp was discovered in the same tanks and was correctly assumed to be a form of *C. sowerbyi* (Payne 1924). Similar polyps were found in Philadelphia and were described as a separate species, *Microhydra ryderi*. Boulenger and Flower (1928) later clarified that *M. ryderi* was the polyp form of *C. sowerbyi*.

The first observation in mainland Europe was 1901 in France (Sowerby 1941). In 1905 the fresh water jellyfish appeared in Germany at Munich (Dejdar 1394, Geiter *et al.* 2002). The first record in Sweden is from 1969 (Jernelöv *et al.* 1970, Lundberg & Svensson 2003). It was first observed in Lithuania in August, 2002 (Arbaciauskas and Lesutiene 2005) in an old gravel pit near the River Nemunas. The northernmost documented occurrence of *C. sowerbyi* are from Finland (Väinölä 2002, Lundberg & Svensson 2003). The freshwater medusa is frequently observed in Western Europe and has been found also in Poland (Wiktor & Witkowski 1999) and Russia (Kanaev 1949, Dumont 1994).

Pathways of introduction

The freshwater jellyfish was most likely transported with ornamental aquatic plants from its native region in China (Slobodkin and Bossert 1991). Usually dispersal of polyps coincides with translocation of stocked fish and aquatic plants or movement of waterfowl (Angradi 1998).

Resting bodies termed podocysts and polyps may accidentally traverse to new habitats on bird's feet or amidst released fish. Under favourable conditions polyps are formed from podocysts (Peard 2005).

Alien status in region

It is very likely that due to sporadic nature and specific conditions required for occurrence of medusae this species already existed in many countries long before the “official” dates of first observations. As an example the species is reported to occur in Estonia in the polyp stage, but not as medusae (Arno Põllumäe, pers.comm.). The known frequencies and occurrences are shown in table 1.

Country	Not found	Not established	Rare	Local	Common	Very common	Not known
Denmark							X
Estonia			X				
European part of Russia				X			
Finland			X				
Faroe Islands	X						
Germany					X		
Greenland	X						
Iceland	X						
Latvia							X
Lithuania				X			
Norway				X			
Poland				X			
Sweden				X			

Table 1. The frequency and establishment of *Craspedacusta sowerbyi*, please refer also to the information provided for this species at www.nobanis.org/search.asp. Legend for this table: **Not found** – The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available.

Ecology

Habitat description

Craspedacusta sowerbyi is a fresh-water cnidarian and has been found in a variety of water environments: freshwater lakes, reservoirs, man-made impoundments, water-filled gravel pits, rock quarries, algae-filled ponds, and rivers. However, despite its ecological diversity, it seems to favour calm water to the rough water characteristic of most rivers (Pennak 1989, Peard 2005). They have

occurred in large river systems, natural lakes, aquaria, and ornamental ponds (Beckett and Turanchik 1980, Kanaev 1949, DeVries 1992, Tittizer *et al.* 2000, Peard 2005). Hydromedusae blooms are most common in summer and fall, from July to October in still or slow moving fresh water bodies, when water temperature rises to at least 25° C. The polyp form is believed to have a much wider distribution than the hydromedusa form, because it exhibits a wider tolerance for cold temperatures (Kato and Hirabayashi 1991, Angradi 1998).

Reproduction and life cycle

Male and female hydromedusae reproduce sexually by releasing eggs and sperm to the water column. Fertilized eggs grow into small, crawling planulae (ciliated larvae). The worm-shaped planula metamorphoses into a polyp.

C. sowerbyi usually occur as single sexed populations, thus sexual reproduction is infrequent (Pennak 1989). Through asexual reproduction, a polyp may bud hydromedusae, frustules (non-ciliated larvae), and/or polyps. Hydromedusa and frustule buds grow and eventually separate from the polyp, while offspring polyps sometimes remain attached to the parent polyp forming a colony. Hydromedusae eventually reach sexual maturity and the cycle continues if environmental conditions are favourable (Pennak 1989, Slobodkin and Bossert 1991).

Dispersal and spread

Local occurrence of the medusae highly depends on environmental conditions such as temperature. Therefore explosions of population may occur and be noticed at irregular intervals of time in different locations. Each subpopulation blooms and disappears in a number of weeks to months, not appearing again at that location for years. Polyps are tiny and therefore knowledge about their distribution is very scarce.

The distribution of the polyps of the species is likely to extend further than the recorded sightings of medusae, especially into colder climates because *Craspedacusta sowerbyi* does not advance from polyp to the more readily identifiable hydromedusa stage in absence of warm temperatures (Pennak 1989, Kato and Hirabayashi 1991, Angradi 1998).

Impact

Affected habitats and indigenous organisms

The role of freshwater jellyfish in food webs as well as their impact on local aquatic communities still remains insufficiently studied. All cnidarians are opportunistic predators and fish egg and larvae might consist a substantial part of their diet. However zooplankton or benthic invertebrates could also be significant as a food source (Dodson and Cooper 1983, DeVries 1992, Dumont 1994, Jankowski and Ratte 2001). Dumont (1994) speculated that *C. sowerbyi* consumes fish eggs, even though it is generally not considered an important predator of eggs or small fish (Spadinger and Maier, 1999).

Fish probably do not consume this jellyfish, but crayfish of the genus *Orconectes* were reported to prey actively on *Craspedacusta* under laboratory conditions (Dodson and Cooper 1983). Therefore crayfish are considered the only important predator of the hydromedusa phase (Pennak 1989, Slobodkin and Bossert 1991). The impact of freshwater medusae on the plankton community was considered to be insignificant, but the impact may dramatically increase with high medusae densities of up to 30 ind./ m³

(Dumont 1994).

Yet another possible impact is increased consumption of dissolved oxygen when medusae densities explode.

Genetic effects

None.

Human health effects

The freshwater medusae are not dangerous to people.

Economic and societal effects (positive/negative)

The freshwater medusae sometimes occur in fresh water aquaria so it may be considered ornamental. One could speculate that in some rare medusae-bloom cases individuals over consume oxygen and so decreases quality of environment fish live in. However no real-world economic effects like decrease of freshwater fish catches were observed so far.

Management approaches

Prevention methods

It appears that individuals of the medusae occur in mass quantities only sporadically when water temperature exceeds 25 C degrees. Since population explosions are only noticed at irregular intervals of time in different locations and cause no major harm, no control measures are necessary.

Eradication, control and monitoring efforts

In the region none of the countries have reported coordinated monitoring programmes to document the spread and impact of the fresh water jellyfish. However, since 2005 German skin divers are called on to report findings of this (and other) alien species to a registration office which is part of a new national project named “Neobiota in diving waterbodies”. Within five months this project has lead to that *C. sowerbyi* was observed at more than 40 different locations in German waters (VDST and BfN 2005). It is very likely that this inconspicuous species is common in German waters and occur throughout the area (Nehring 2005).

Information and awareness

Today the occurrence of the fresh water jellyfish in Germany and a few other countries is generally accepted by various institutions and experts and is not the subject of public attention. However, a purposeful information platform has not yet been installed. Education and awareness-raising is needed. A first interesting step is the start of a new national project named “Neobiota in diving waterbodies” in 2005. German skin divers are call on to report findings of this (and other) alien species to the project registration office (VDST and BfN 2005).

Knowledge and research

Although biology of the *Craspedacusta* is well known, due to very sporadic and unpredictable occurrence distribution area of this species may be underestimated and therefore this subject requires more studies.

Recommendations or comments from experts and local communities

Registering species occurrence by simply asking people to inform local authorities in case they see the medusae somewhere might provide better understanding of how widely this species is spread.

References and other resources

Contact persons

Stefan Nehring (DE), AeT umweltplanung, Bismarckstrasse 19, D-56068 Koblenz, Germany; Phone: +49 261 1330398; E-mail: nehring@aet-umweltplanung.de

Arno Põllumäe (EE) Estonian Marine Institute, University of Tartu, Mäealuse Str. 10a, EE-, 12618 Tallinn, Estonia, Phone: +3726718974, E-mail: arno@sea.ee

Risto Vainola (FI) Zoological Museum, POB 17, FI-00014 University of Helsinki, Finland. E-mail: risto.vainola@helsinki.fi

Gísli Már Gíslason (IS) Institute of Biology, University of Iceland, Askja-Natural Science Building, IS-101 Reykjavik, Iceland, E-mail: gmg@hi.is

Andrzej Wiktor (PL), Wladyslaw Rydzewski Natural Museum, Wroclaw University, ul. Sienkiewicza 21; 50-335 Wroclaw, Poland, phone +48 71 3754144, email: awiktor@biol.uni.wroc.pl

Melanie Josefsson (SE), Swedish Environmental Protection Agency, SE106 48 Stockholm, Phone: +46 18 673148, E-mail: Melanie.Josefsson@snv.slu.se

Links

Microscopy [pictures](#) of jellyfish in many life-stages

Indiana University of Pennsylvania – [Freshwater Jelly fish pages](#)

Aquatic alien species in German inland and coastal waters ([database](#))

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