The Roman Republican wreck Ilovik–Paržine 1, island of Ilovik (Croatia), Preliminary report

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Abstract: Discovered in 2016 in the bay of Paržine, Ilovik Island (Croatia), the wreck Ilovik–Paržine 1 has been systematically excavated by a joint Croatian and French team from 2018 to 2021. It was a mortise-and-tenon built sailing ship of about 20–22 m in length, transporting a cargo of Adriatic Greco-Italic amphoras containing wine and timbers. Its last voyage took place between to the 2nd or 3rd quarter of the 2nd century BC. Thanks to the ballast, the rear third of the ship was better preserved than the bow, part of which was found about 20 m to the east. The ship has a typical Hellenistic hull design (a cross-section with a wine-glass profile), and the large mortise on the easternmost end of the keel could be related to a specific ship shape characterized by nearly vertical stem.

Keywords: Croatia, Ilovik, wreck, mortise-and-tenon, Roman Republican

1. Introduction

The bay of Paržine lies to the south-east of the island of Ilovik in the Kvarner archipelago in Croatia. This bay is particularly well sheltered from the strong wind blowing from the northwest quadrant, the bura, but it is particularly exposed to the winds and storms from the southern quadrant (Fig. 1). It was here that Miran Erič, a conservator from the Slovenian Ministry of Culture, discovered in 2016 the remains of a mortise-and-tenon built ship emerging from the sandy bottom at a depth of 4 m, about 30 m from the beach. Erič reported the discovery to the director of the Lošinj Museum, Zrinka Ettinger Starčić and, the following year, Igor Miholjek from the Department for Underwater Archaeology at the Croatian Conservation Institute, organized a short survey which confirmed the interest for the site and the good preservation of the wooden structures.

During the survey, the upper part of the north side of the wreck was partially uncovered. Twenty frames and three strakes joined by pegged tenons were documented (Miholjek 2018). A wood sample was sent to the Beta Analytic laboratory for AMS radiocarbon dating. The results of the intercepted age with calibration curve indicated a date of 170 BC (cal BP 2120).[1]

In 2018, Igor Miholjek contacted Giulia Boetto of the Centre Camille Jullian to start an international collaboration focused on the excavation and study of the ship's remains. The 5th and final campaign took place in September 2022 with the main objective of probing the area around the wreck in search for any detached parts of the ship and its cargo.

Thanks to an agreement signed between the Croatian Conservation Institute and the Croatian Ministry of the Interior, the project had the opportunity to accommodate all participants in a building belonging to the Special Forces of the Police in the bay of Kovčanje on the island of Lošinj. The collaboration with the Special Forces of the Police ensured the logistical support necessary for an underwater archaeological mission (filling of tanks, storage of diving equipment and archaeological material, running water, basins for desalination, work spaces, internet) including the motorboat to reach the bay of Paržine, located 13 nautical miles south of Kovčanje.

Each year in September, the work program was divided into several activities starting with the excavation, cleaning and labelling of the finds and the structure of the ship, continuing with the systematic application of the photogrammetry as the main method of documentation but also employing direct measurements and observations, carrying out selective dismantling of structures to reach and document hidden parts of the hull, sampling for analyses, and ending

[1] Laboratory code: Beta-454977 Ilovik 1.

with the final protection of the site with sand and sandbags. In parallel, a large number of others documentation activities were carried out in Kovčanje base. The elaboration of the digital 2D and 3D documentation, the restoration of finds, the study of amphoras and ceramics, and several archaeometric analyses are in progress.

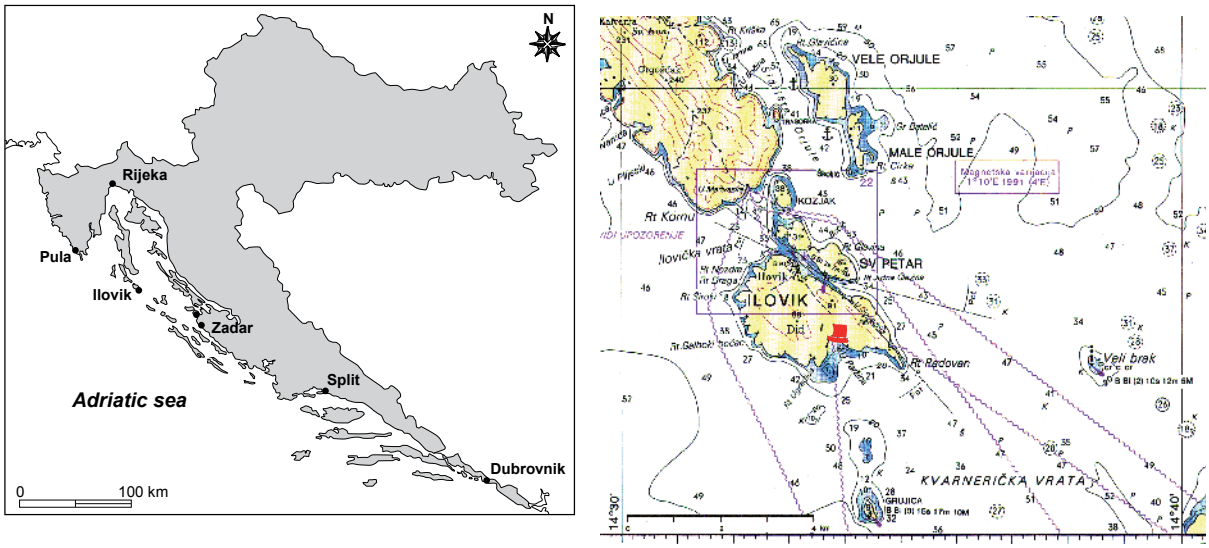

Fig. 1 Location of the wreck in the bay of Paržine, Island of Ilovik (drawing: V. Dumas, CNRS, CCJ)

In 2018, the part of the hull located in 2017 could not be found. Instead, a small survey revealed the front end of the bow structure, oriented north/east-south/west, and, to the north, a large amount of intertwined wood, detached pieces of the ship structure, the remains of amphoras and some other objects belonging to the life on board. In 2019, the trench was extended to a total area of 58 m^2. The entire bow structure, inclined towards its starboard side, was cleared over a length of 10 m. The main objective of the 2020 mission was to relocate the part of the hull seen in 2017 that was not found in 2018. The initial program included systematic trenching in the north/south, east/west, and northeast/southwest directions, starting from the 2018-2019 trench. The after third of the ship was found about 20 m away from the bow structure, in a westerly direction. The ship rested on its port side which, protected by the ballast, was better preserved than the starboard side. The after third, oriented like the bow towards the north/east-south/west, was excavated from 2020 to 2021 thus reaching a total trench area of about 70 m^2 (Fig. 2) (Miholjek, Boetto 2021).

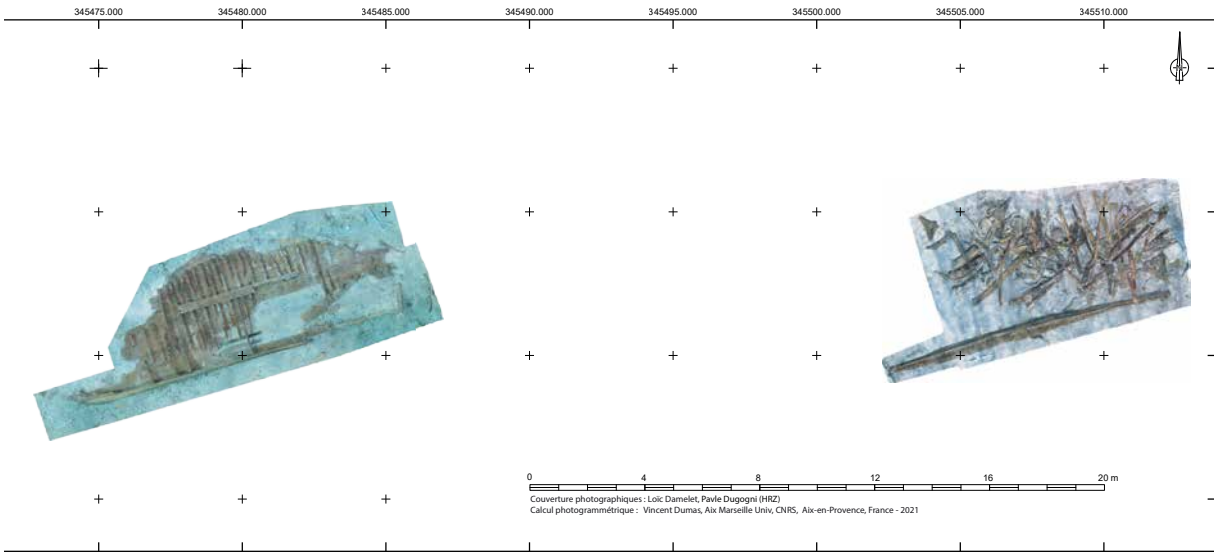

Fig. 2 Ilovik–Paržine 1. Ortho-images of the two trenches: on the left, the rear third of the ship excavated in 2020-2021; on the right, the bow section with the cargo of timbers on the north excavated in 2018-2019 (photos: P. Dugonjić, HRZ; photogrammetry: V. Dumas, CNRS, CCJ)

On average, 19 people participated in the four underwater campaigns on the Ilovik–Paržine 1 wreck, totalling 780 hours of underwater work and 450 dives, and investigating a total area of around 300 m^2.

2. The cargo and other artefacts

The ship was transporting a cargo of timbers and wine contained in amphoras (Fig. 3). Most of them were found fragmented and scattered around the wreck, and analysis of their diagnostic parts showed that they belonged to the Adriatic Greco-Italic type, which was produced between the middle of the 3rd century BC and the first decades of the 1st century BC when the form evolved into the Lamboglia 2 (Fig. 4)[2]. A precise date for the Ilovik–Paržine 1 amphoras is difficult to determine on the basis of comparisons as complete specimens are rarely found in well-dated contexts. Marie Brigitte Carre (CNRS, CCJ), who is in charge of their study, tends to date the amphoras of the Ilovik–Paržine 1 wreck to the 2nd or 3rd quarter of the 2nd century BC.

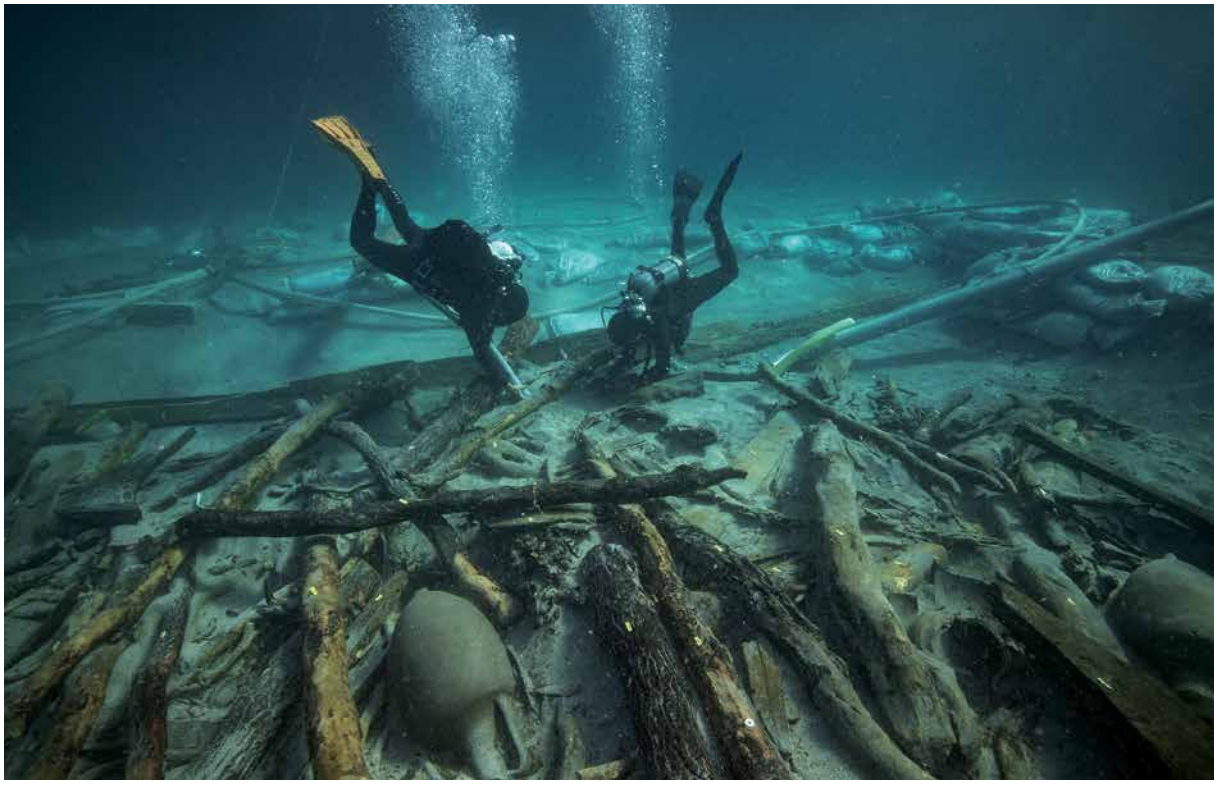

Fig. 3 Ilovik–Paržine 1. Excavation of the cargo of timbers north of the bow section. Two of the best-preserved Adriatic Greco-Italic amphoras are visible in the foreground (photo: L. Damelet, CNRS, CCJ)

The ship was also carrying a cargo of logs and boughs, the majority of which were found on the bow area. Two samples were submitted to Centro di Datazione e Diagnostica (CEDAD) of the University of Salento, Lecce (Italy) for AMS radiocarbon dating.[3] The results, although indicating a very large interval for the felling of the trees, are not in opposition to the AMS radiocarbon dating of the wreck and the preliminary date of the amphoras. The xylotomic analyses, realized by Carine Cenzon-Salvayre and Alba Ferreira Domínguez, indicate that the trunks and boughs (average diam. 80 mm and 0.23 m respectively, up to 2.5 m long) were mostly cut from evergreen oaks (*Quercus ilex sp*.), stone pines (*Pinus pinea L.)* and small trees and shrubs belonging to the genera *Phillyrea* or *Rhamnus*. Most of timbers preserve their bark and evidence of cutting at one end. A huge number of twigs (diam. 25 mm on average) were also found. As most of them belong to the same species of the larger timbers, they probably are the result of the delimbing process. Wood analyses attested also the presence of twigs from grape (*Vitis vinifera*). All these twigs probably served as dunnage protecting the cargo in the hold (Tchernia *et al.* 1978; 2021).

[2] The manufacture of amphorae in the Picenum region (Italy) is based on macro-and-microscopic analysis of the clay. The analyses were carried out by Claudio Capelli (DISTAV, University of Genoa, Italy).

[3] Radiocarbon ages: 2178 ± 45 BP sample LTL19759A from pole PA19/W65; 2089 ± 45 BP sample LTL19760A from pole PA19/W106.

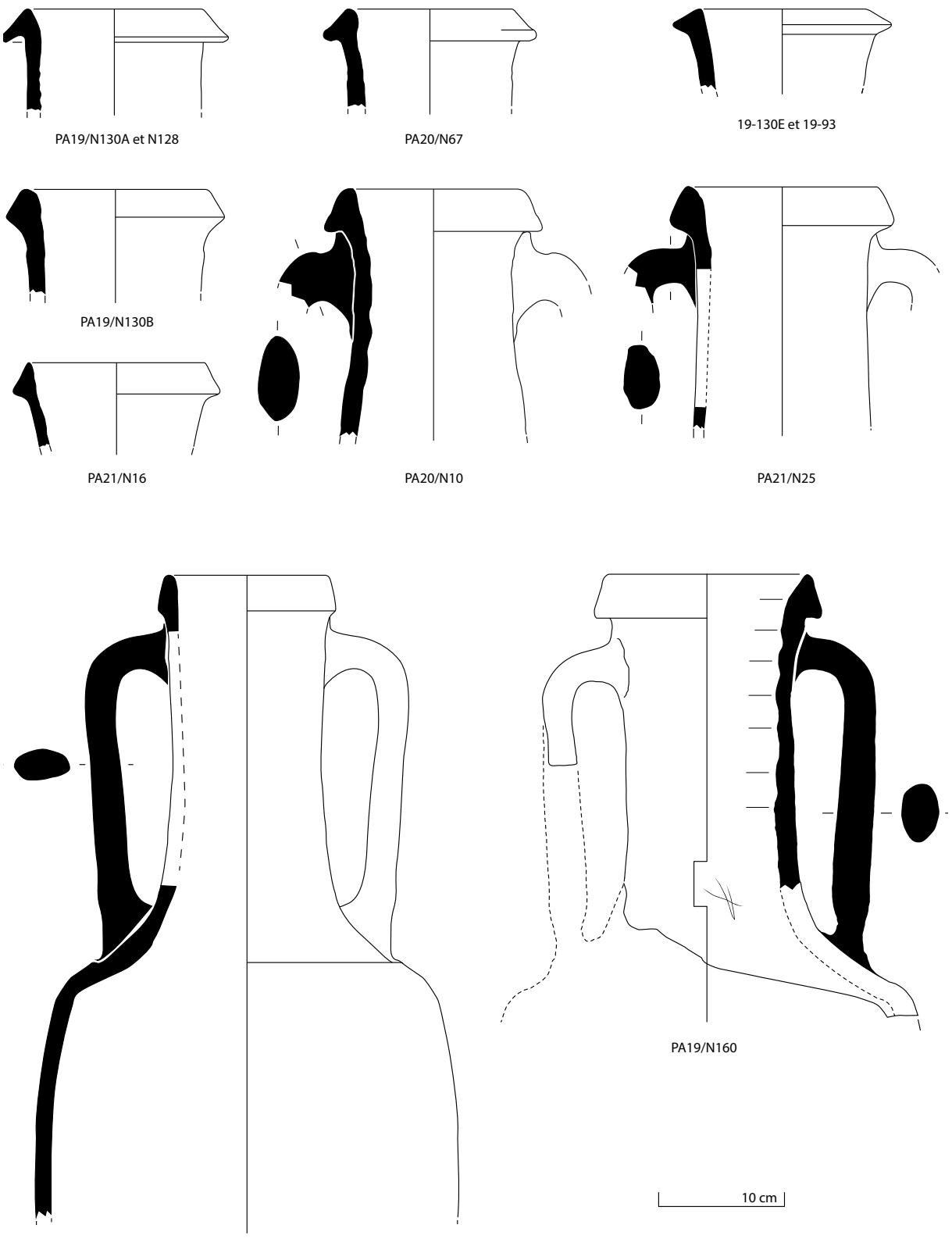

Fig. 4 Ilovik–Paržine 1. Greco-Italic amphoras from Picenum (drawings: L. Cavassa, V. Dumas CNRS, CCJ)

A few fragments of black glazed and cooking ware, a small lamp with traces of soot, part of a *catillus* of a grinding stone and some carpenter's tools (a marlin spike and part of a bow drill) testify to life on board, although the most sensational find is a small female bronze statuette (Fig. 5). Its base was nailed to the structure of the ship and it is likely that it represented the tutelary goddess worshipped by the sailors.

Fig. 5 Ilovik–Paržine 1. 1. Bronze statuette (photo: P. Dugonjić, HRZ)

3. The ballast

The stern area of the hull bottom was covered by a compact layer of rocks and pebbles corresponding to the ballast (Fig. 6a). During the 2021 campaign the rocks were retrieved in order to study the architecture of the ship. 864 rocks (from 10 to 40 cm) were examined by two geologists from the European Centre for Research and Teaching in Environmental Geoscience (CEREGE, Aix-en-Provence, France). All are predominantly carbonate sedimentary rocks and a selection of 72 samples was made for further laboratory studies allowing a finer microfaciological and micropaleontological characterization.

Fig. 6 Ilovik–Paržine 1. a) View from the south-east of the stern with the ballast (photo: L. Damelet, CNRS, CCJ); b) View from the north-east of the frames at the stern. Note the wine-glass profile of the ship. The stringer C4N is nailed to the frames (photo: L. Damelet, CNRS, CCJ); c) Detail of the large mortise carved on the upper face of the keel, at bow. It was intended to lodge a stem not preserved. On the right, two detached floor-timbers can be seen and, on the left, a large trunk belonging to the cargo (photo: L. Damelet, CNRS, CCJ); d) The winch found in the bow area (photo: L. Damelet, CNRS, CCJ)

4. The wreckage and post-deposition processes

With regard to the dynamics of the wreck, a likely hypothesis is that the ship may have hit a shoal (e.g. the one to the west of Paržine Bay) and that the impact damaged its keel. The ship tried to find refuge in the bay before sinking. In fact, the deposit corresponds to the remains of a ship which broke up, as the two main preserved parts of the hull of Ilovik–Paržine 1 are located at a distance of about 20 m and a large part of the axial and other structures of the ship have been destroyed over time, and especially in the last decades by natural and anthropogenic factors, as the site is shallow and subject to coastal erosion and cyclical movement of sandbanks that cover and uncover the hull structures.[4] In addition, in summer, a large number of pleasure boats anchor in the bay. Finally, due to the shallow depth and proximity to the coast, the cargo was probably salvaged in ancient times or looted later.

[4] This is the reason why the part of the ship discovered by Erič in 2016, was seen in 2017 but not in 2018 as it was covered by a huge amount of sand. In contrast, in January 2021, after a very violent storm, the protection put in place at the end of the 2020 mission broke down and few fragments of the hull were found on the beach.

5. The ship remains

The ship has a typical Hellenistic hull design (a cross-section with a wine-glass profile) and structure (Pomey 2020). The keel, 10.5 cm sided on the top and 19.5 cm at its maximum, and 20 cm moulded, forms with the garboards a typical wine-shape section (Fig. 6b). The garboards (max thickness 7.4 cm) are trapezoidal in section and joined to the rabbets cut in the upper angles of the keel by large pegged tenons inserted in mortises whose average width is equal to their room-and-space (8 cm).

In the direction of the stern, the keel (K7W) is assembled to a transitional timber (K6W) by a hook scarf secured by a key, rectangular in section and driven perpendicular to the scarf. The assembly between the transitional timber and the sternpost K4W is similar and, here, the scarf is reinforced internally by a timber K5W (1.45 m long, 15 cm wide). The assembly of the garboards and the other strakes into the rabbets is made by pegged tenons and secured by nails (Fig. 6c).

In the bow area, the axial carpentry is composed by two timbers (K1E and K3E) joined by a scarf and reinforced internally by a timber K2E (2.7 m long, 15 cm wide) (Fig. 6c). The foremost timber rises gradually and ends abruptly. Here the upper face is carved with a large mortise (15 cm long, 10 cm deep, 5 cm wide) to settle a stem that was fixed by a pair of dowels. A metallic sheet was inserted in the joining for watertightness. This structure of the keel gives the ship a very peculiar shape, rarely documented in the archaeological record.

The planking, with an average thickness of 4.4 cm, is flush-laid, carvel built, and assembled by pegged tenons. The pegs (average internal diam. 1.4 cm) are spaced on average 14 cm apart (center-to-center). In the after third of the ship, 18 strakes are preserved on the port side and only 3 on the port side. Most of the strakes consist of two planks joined by oblique scarfs.

The frames have only been found in their original position in the after third of the ship (Fig. 6b). They are connected to the planking by treenails driven from outboard (average internal diam. 17 mm) and have the classic alternation of floor-timbers extended by futtocks and half-frames with a side-to-side space of 16 cm on average. The half-frames begin at the level of the 3rd-4th strakes and the futtocks around the turn of the bilge. It should be noted that the identification of this part of the hull excavated in 2020 and 2021 with the after third of the ship is based on the observation of a single anomaly in the alternation of the frames, not far from the extremity of the keel. The shipwrights did not position a floor-timber (F160) and left a free space in the hold where the bilge pump (not preserved) was probably located.

The floor-timbers are up to 45 cm moulded on the keel and have a triangular limber hole at their foot. The other dimensions are similar to those of the other frames (on average 8 cm sided and 11 cm moulded).

The bottom was covered by a ceiling found under the ballast still in its original position at stern, and completely destroyed and mixed into the cargo of wood in the bow area. In the after third of the ship, the ceiling, 1.8 to 2.4 cm thick and 20 cm to 28 cm wide, is mostly nailed to the frames.

Unfortunately, keelson or mast-step remains were not preserved on the wreck. However, one displaced floor-timber (W16) found near the bow structure has a rectangular recess on the top 29 cm long. This measure corresponds to the minimum width of keelson/mast-step. The presence of a sail is confirmed by the discovery of two pulley sheaves. Also in the bow area, an oblong wooden object (56 cm long and 10 cm in diameter maximum) was found that we interpret as a winch, possibly linked to the ship's rigging (Fig. 6d). The hull was entirely covered on the outside and inside by a thick layer of pitch.

6. Conclusion

Following the notion of architectural types and the concept of principles and methods of construction (Pomey 2004; Pomey, Rieth 2005: 29–33; Pomey *et al*. 2012; 2013), the construction principle of the ship Ilovik-Paržine 1 is based on a shell first concept for the hull structure, and on a longitudinal strake-oriented concept for its shape, while the building process is shell first.

Although the study of the ship is at its early stages, it is possible to reconstruct that its original length was about 20–22 m. Of note is the longitudinal section towards the bow with a stem post forming almost a right angle with the keel (Fig. 7). With the completion of the archaeological study, one of the future challenges will be to arrive to a satisfactory reconstruction of the hull profile and ship structure.

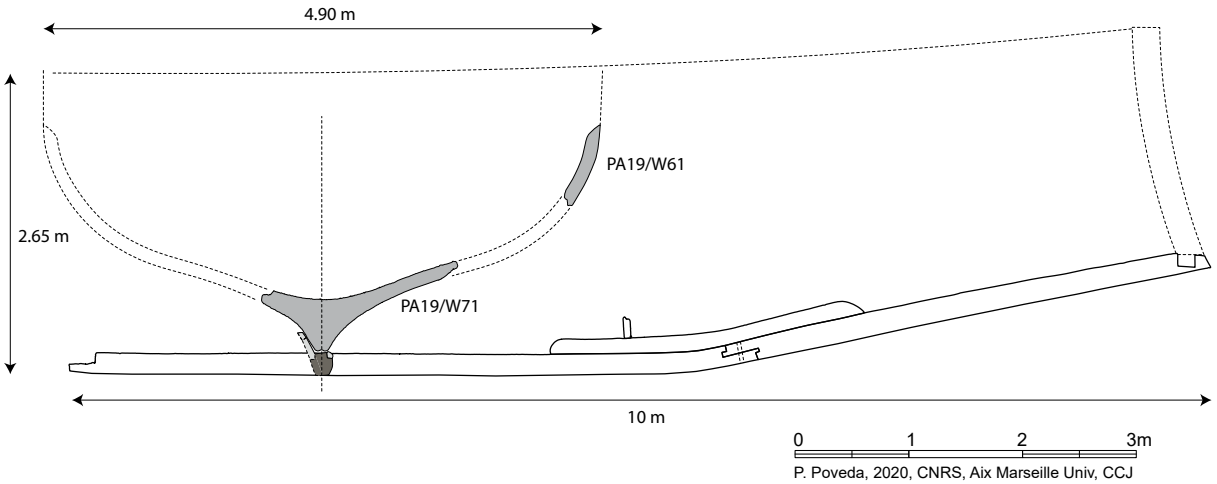

Fig. 7 Reconstruction hypothesis of the bow of the ship Ilovik–Paržine 1 (drawing: P. Poveda, CNRS, CCJ)

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