

A short overview of the traditional ship's type constructed by the wooden shipbuilding "school" from Korčula, Croatia

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Abstract

The paper deals with a short history of shipbuilding on the island of Korčula (the cradle of the Croatian shipbuilding industry); the main wooden ships types built in the past in the Korčula's wooden shipbuilding school were presented.

Keywords: historical overview, wooden ships type, Korčula's wooden shipbuilding "school".

1 Introduction

The island of Korčula is situated in the southern parts of the Croatian Adriatic coast (Dalmatia); due to its geographic position, it played a very important role in shipbuilding and maritime affairs in the past. That was the reason why, in history, great sea power nations like the Greeks, the Romans, the Venetians the Franks as well as the British, the Russians, the Italians and finally the Croats wanted to exert control over a narrow channel between Korčula and the Pelješac peninsula, on their way from Dubrovnik to Venice. The intensive traffic through the Pelješac channel and famous pin forests all over the island were in the past an important source of shipbuilding material, which was a good condition for the wooden shipbuilding development [1, 3].

According to archaeological finds, the history of the island of Korčula started in the Old Stone Age (XX millennium BC - The Big Cave in Vela Luka and The Jacas Cave in Žrnovo), whereas the beginnings of navigation can be traced back to the Mesolithic (VIII-X millennium BC, by the sea-line Gargano – Palagruža – Korčula). The first Greek colony, Korkyra, was founded in the VI century BC by



the Dorians (from the Greek town of Knydos), which is witnessed by the “Lumbarda’s psephism”, the oldest written monument in this part of Europe. After the Dorians, in the III century BC, a sub-colony was founded in Lumbarda, by Isseas and later on in the II century BC another one by the Illyrians, local people who held the whole island as their pirate base.

The Statute of the Island and Town of Korčula, of 1214, which is considered to be the first written document concerning shipbuilding in Korčula, gives evidence of the stone and shipbuilding manual trade, wood cutting, limitation on both wood export and pitch production, etc. The first shipyards were built at the beginning of the XV century and data concerning the building of ships were written in a judicial document as early as 1418; it was noted down that “ a certain Vukić accused a caulker Bogić, because the latter attacked him at the place where a *Karaka* was under construction” [1]. It can be concluded that a big wooden boat *Karaka* was built in Korčula. Shipbuilders from Korčula were considered to be inventors of some other famous ships and boats like *Liburne*, *Korkyra* and *Falkuša*. The Roman Navy and the Neretva pirate boats were also built on the island in the period from IX to XI centuries. There were two shipyards in the town: *Borgo superiore* - on the west and *Borgo inferiore* on the east side of the town; that was a good natural location for building and launching ships [3, 4]. A well-known Venetian mapmaker Vincenzo Maria Coronelli named the east shipyard “glorious” (“*squero famoso*”, Fig. 1), and published his drawings in 1688.



Figure 1: The East Korčula’s shipyard (“*squero famoso*”), end of the XIX century.

In the past, shipbuilders from Korčula were building boats all over the world - Constantinople, Salina, Smyrna, Alexandria, Port Elizabeth, Livonia, Odessa, New Orleans, New York, Tacoma and Buenos Aires – by using their own construction method.

Up to the Vienna congress in 1815, Korčula was under the Austrian-Hungarian kingdom. At that time, shipbuilding developed increasingly. A bad economical situation in the country forced shipbuilders to protect their interests and they

established an association named “The First Dalmatian Kobash” in 1908. All crafts joined the association. There were over 30 small shipyards on the island at that time. In the period between the two world wars, the majority of shipbuilders emigrated, and those who remained kept on building two-mast coasters, sailing ships, and especially small ships for Istria, Albania and Greece [1, 4]. The Second World War brought to Korčula the Italian occupation, and the *Navi Curcola* was founded in the west parts of the town. The first ships were “motor launches” (*motolancie*). After the capitulation of Italy, the Popular Liberation Forces (partisans) built up the First partisan shipyard in Vela Luka, not in the town of Korčula since German soldiers were in the immediate vicinity (on the Pelješac peninsula). In 1944 shipbuilders from Korčula moved to the islands of Vis (Komiža), Lastovo and even to Bari (Italy).

After the Second World War, in 1949, one of the shipyards, *Korčula*, was restored. It was built up on a new location outside the town, where it is still today. Unfortunately, it was destroyed in 1955, when a fire broke out in the pre-assembly hall with all production in it. The bankruptcy was proclaimed a few years later, and a few months after a small wooden shipyard, *Brodograditelj*, was founded at the same location. A new type of wooden motor yachts, named *Motonave*, was designed. These yachts were of a specific form with a cabin and a stern transom. Nearly at the same time another shipyard - *Inkobrod* - was restored [7]. In 1967, the *Inkobrod* from Korčula and, a factory for metal construction production, *Radež*, from Blato (also on the island of Korčula), united to form the *Korčula's Shipbuilding Industry* (KSI), but not for long. After 1970, *Inkobrod* and *Radež*, as separated factories, became well-known producers of hatch covers under the license of the Mac Gregor company from Finland. At the beginning of the 1990s, the shipyard passed through a very hard phase in the time of the Croatian War of Independence, caused by a bad economic situation in the country. The *Inkobrod* shipyard declared bankruptcy for the second time in 1997. In this moment, the shipyard is hired to the Netherlands firm *Peters*.

In the Mediterranean shipbuilding heritage, the Korčula shipbuilding “school” has remained well-known for its famous boats forms of various types and purpose, as well as for good sea keeping and maneuverability, excellent quality, and above all for very simple and very good construction solutions; these design solutions were based on a rather long experience and specific construction method, named *Mezzaluna* (“buška”), which will be the topic my next papers [7, 8, 9].

Unfortunately, of all shipbuilders of the famous Korčula wooden shipbuilding school there are only a few working in Korčula today, and only one working on the neighboring islands of Lastovo and Mljet [7, 8].

2 The main wooden boat types of the Korčula’s shipbuilding “school”

In the XV and XVI century, Karaka, a big merchant wooden sailing-ship was being built in Korčula’s shipyards.



Karaka (Fig.2) was a sailing-ship with a heart hull form, with lowered hull and a very well balanced main mast. The main mast had two lufsails, and one at the fore. It was built in a range of: L=38-40 meters, B=14-15 meters, D=4-5 meters, with the deadweight tonnage from 945 to 1260 tons (600 – 800 cars), about 40 guns of armament, and about 100 members of the crew.

In the XVII and XVIII century a series of sail ships were built, like a two-mast coaster, brig, brigantine, barque, schooner and logger [1, 2].

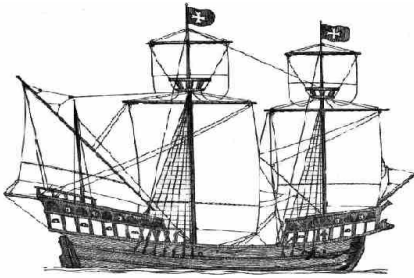


Figure 2: Korčula's Karaka.

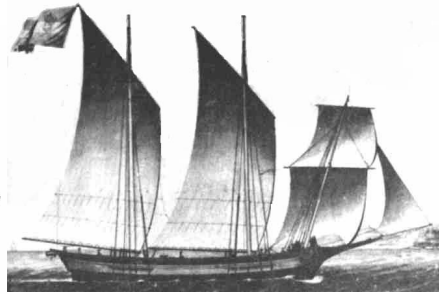


Figure 3: Two-mast coaster "Glorioso" (1798).

Two-mast coaster (Fig.3) the last Adriatic merchant wooden sailing ship was a traditional product of the most East Adriatic shipyards, with two masts, special sails and flock over the long bow rake girder. The deck was along the whole length of the ship, with only one hatch, without twin-deck. It was built in a range of: L=14-20 meters, with deadweight from 40 to 140 tons.

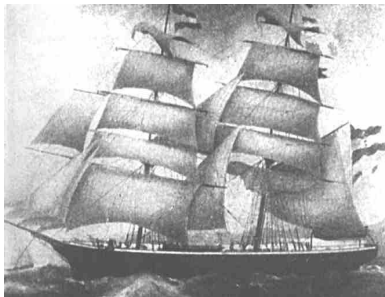


Figure 4: Barque "Genitor Nicolo" (1854).

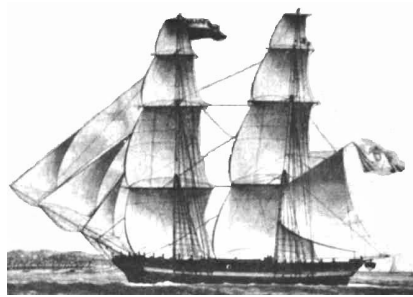


Figure 5: Brigantine "Arabo felice" (1823).

A very simple outfitting, good maintenance and steering characteristics were the reasons of its widespread use. Nowadays, these ships are reconstructed into tourist ships or sand-boats.

Barque (Fig.4) was a big merchant wooden sailing ship for overseas transport, and was the biggest merchant ship at the end of the XIX and the beginning of the XX century, different from other sailing boats. Its deadweight was from 800 to 1000 tons, and the deck house was used for passengers.

Brigantine (Fig.5) was a two-mast wooden sailing ship with the stay-sails, square-sails and gaff-sails. It had a sharp angle bow, and semi-circular or rectangular stern, with the rudder near the aft part of the hull as far from the deck with the steering wheel. It sailed all over the Mediterranean; it had well-orientated sails for various winds, and a small number of the crew.



Figure 6: Brig “Cavalier Macedonia” (1819).



Figure 7: Brig “Splendido”.

Brig (Figs. 6 and 7) was a two-mast wooden sailing ship with two square sails at both ends. It had the framework of the Mediterranean transport ship, but it sailed all around the continents. A well-known brig on the East Adriatic coast was “*Ferdinando V Re d’Ungaria*” built in the shipyard of Mali Lošinj (Croatia), which was the first to sail around the Cape Horn; *Splendido* from Kotor (Montenegro), sailed around the world from 1852 to 1859, the sixth time after Magellan.

In the old Korčula wooden shipbuilding, there were no detailed designs because each shipbuilder had his own secrets of the craft, but there were some general rules and regulations like:

1. “The proportions between length, breadth and draft of the ship are very important for the speed of the ship. Thus, good proportions between length and breadth are:
 - for the old sailing ships: $L/B=3.75-4.5$
 - for the clippers: $L/B=5-7$
 - for the modern sailing vessel:

-big	$L/B= 4.5-6.8$
-medium	$L/B=3-5.75$
-small	$L/B=2-3$
2. The draft of the wooden sailing ship depends on its stability and the water on which it has to sail. The very good proportions for the draft are:
 - for the wooden sailing ships:

- big:	$d/B=0.38-0.48$
-small:	$d/B=0.25-0.43$

- for the steel sailing ships:
 - big Barque: $d/B=0.51-0.53$
 - small Barque: $d/B=0.49-0.50$
 - 4-mast Barque: $d/B=0.49$.”

(Cited in the manual “The Theory of Ships”, Trade school - shipbuilding department in Korčula, 1913)

Switching over to building steel ships, shipbuilders in Korčula stopped with big wooden sailing ship production, because of the needs for deadweight size and speed. That was the reason why the wooden shipbuilding “school” of Korčula, after The Second World War, was oriented to the production of small units and recognizable types from the past, like: **laja**, **kajić**, **skalet**, **pasara**, **bajbot**, **guts**, **ribarica**, **batilo**, **trajta**, **leoot**, **gajeta**, **filuga/falkuša**, and the modern units like: **passenger boat**, **motor yacht/ “motonave”**, **combined sports boat**, **tourist vessel**, **traveler ships**, **cargo-ship**, etc [2, 6, 8].

From the large spectrum of the small wooden boat types, the following ones can be discerned for their very good sea keeping characteristics, good form, excellent stability, and security:

“**Laja/gondola**”: is a small boat of a very simple design, transom square-stern, rectangular or trapezium shape, rowboat. The stem is straight and inclined forward, with L to 4 meters. They were kept in motion by oars, or could be propelled by an outboard engine. This boat is decidedly suitable to start having a flat bottom of the planning hull, and therefore obtains greater speed.

“**Kajić**”: is a small boat, with the square-stern form, and small deck on the bow for the fishing tools (fish-trap, fish-hook), of classic building, and very fine bow form with L up to 4 meters. Kept in motion by oars or outside engine, it is used for small fishing, passengers’ transport and as the lifeboat on bigger ships.

“**Skalet**”: is the longest type of the *kajić*. It was used for training as a rowboat, with L up to 12 meters, and B about 2 meters.

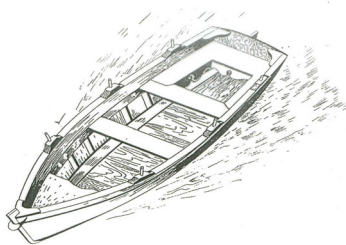


Figure 8: Laja/gondola.

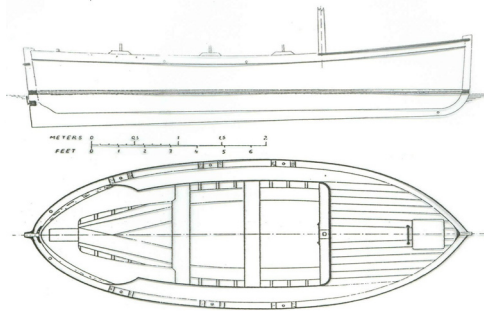


Figure 9: Guts.

Lifeboat (Bajbot): is a small boat of classical form, serving as a lifeboat on the smaller cargo ships or as the small work-boat, with the rounded and transom stern, with L up to 3 meters. It uses rowlocks for rowing, or is kept in motion by the outside engine.

Guts (Guc): is one of the finest boats afloat, and is one of the old national types, propelled by oars or rig, but may be also powered by a special joined wooden piece. The length L is from 4.5 to 7 meters. It has only one boom at the top of the sail, fastened to the mast. The bow and stern are straight in the vertical direction. Its sheet and tiller are arranged so that one person can work easily. Guts is chiefly used for fishing, smaller freight as well as for sports.

Pasara: is a smart boat that will take you anywhere in comfort, rowed, rigged or powered. The construction is simple with a solid deadwood for strength and good steering qualities. She has been sturdily built, safe and fast, with length L to 5 meters. Considering construction, it was first and foremost a rowing boat, the stem of the stern is sufficiently strong so that propeller axis may pass through it enabling the placement of an engine. A Latin rig may be added also. It is used for tourist purposes and for fishing with small fishnets, fish-trap and fish-hook.

Sports fishing boat (Ribarica): is an excellent sea boat, with sharp curving to outside bow frames and a rounded stern; she is well qualified for smart sailing; kept in motion by long oars, or in recent times, inside engine. She is suitable for all methods of fishing: smaller fishnets, draft net fishing and long lining as well as angling. On the one side of the hull she has amidships deck, at the bow (as lamplight fishing boat) or at the stern (as the fishnet fishing boat). The length L is from 5 to 7 meters.

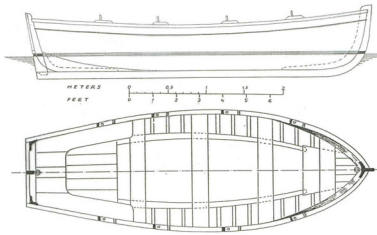


Figure 10: Pasara.

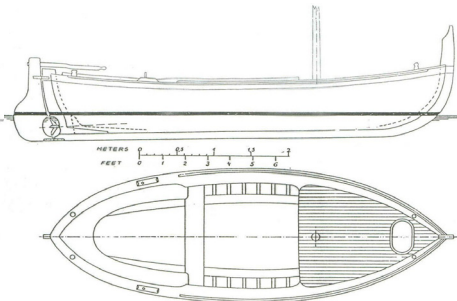


Figure 11: Sport fishing boat.

“Batilo”: is one of the short sport fishing rowboat type, without amidship deck, but with a small seating deck at booth ends, and two benches in the middle of the interior. The length L is 4 to 5 meters.

Trayta: is a national type of fishing boat for the economy minded sailor. She is specially tried out as the type of fishing boat, with three hatches in the closed deck. Sword-fish elongation of the bow is especially suitable for landing on the banks and dunes. If desired, the bigger classes may have five to seven hatches. The length L is from 7 to 9 meters and has sharpened and curved to outside bow frames, for saving from the waves, and large and inside curving stern, for stability and the bigger working place during the fishing. Kept in motion by long oars, rig and inside engine.

Leoot: it embodies the best features of the past, and the highest standards of the present through constant proving and improving. It has the deck on both ends of the hull, with one hatch opening in it, and open middle part, which can be

covered by wooden hatch covers if it is necessary. Sword-fish elongation of the bow is especially suitable for landing on the banks and dunes. It is supplied by mast and Latin rig, and it is staunch dependable craft. Fundamentally it is built for fishing purposes, but may be used also for cargo. The length L is from 8 to 12 meters and it uses inside engine for its propulsion, rig, or roved having five rowlocks adjusted for this purposes [7].

Half-decked one-mast fishing boat (Gajeta): is similar by form to leoot, multipurpose boat for fishing, and also for transport of people and goods (different materials, vine, stones, furniture etc.) She has a deck on both ends of the hull, and in the middle of the hull a big hatch opening, with hatch covers. The bow is a little rounded and the stern a little sharpened and straight. The length L is from 7 to 11 meters with one mast and Latin rig. For propulsion, rig, oars or nowadays, inside engine may be used.

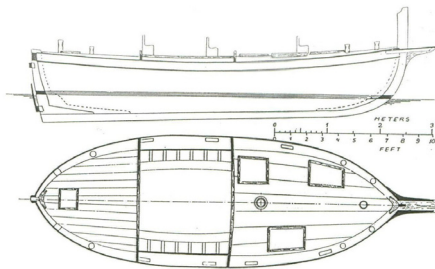


Figure 12: Trayta.

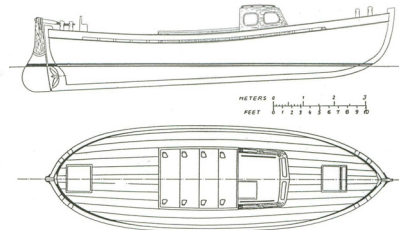


Figure 13: Leoot.

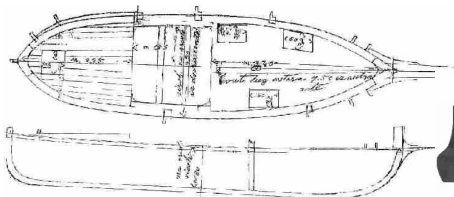


Figure 14: Original design of Korčula's leoot (designed by L. Depolo, 1910).



Figure 15: The leoot's wooden model.

Half-decked one-mast fishing boat *Falkuša*: in Korčula's shipbuilding named "*Filuga*", it is fundamentally a special fishing boat constructed for three-week fishing around far away islands, supplied with special joined parts to the side plating, named "*falci*", i.e. "dead – sides", which were made in Komiža – home port on the island of Vis, as supplement parts for increasing the freeboard, which is positioned on the boat at homecoming, after successful fishing, as a boat in this case had a bigger draft. The bow frames are rounded and at stern are sharpened, with a small seating deck at the bow and a normal deck at the stern, for saving the waves entrance, decreasing resistance and easily maneuvering in

fishing. She has one mast and two rigs, the main and small bow rig (flock), for better use of the wind. In the middle of the boat, she has on sides about 0.2 meter long plating wooden beam, named “*traštan*”, for easy pulling out the boat at the rocky coast. Essentially, it was built for the island of Vis, whose fishermen were fishing around the island of Palagruža, so far away from their home island [9]. Finally, “*Falkuša*” represents two different boats in the same construction, and also the perfection of Korčula’s wooden shipbuilding school. The length *L* is from 8.5 to 9.5 meters, because it was forbidden to go to the island of Palagruža for the boats under than 8.5 meters and is kept in motion by long oars and rigs.

Seasonal cruising boat is an ideal boat for the entire family. Her unit rig permits one man handling in all weather, under sail or auxiliary power. The shown arrangement seems the best from the standpoint of accessibility. She is envisaged for two comfortable beds, but may provide berth also for four. The boat is splendid for cruising and fishing purposes. Rowing may be applied from time to time as auxiliary means. The length *L* is up to 7 meters.

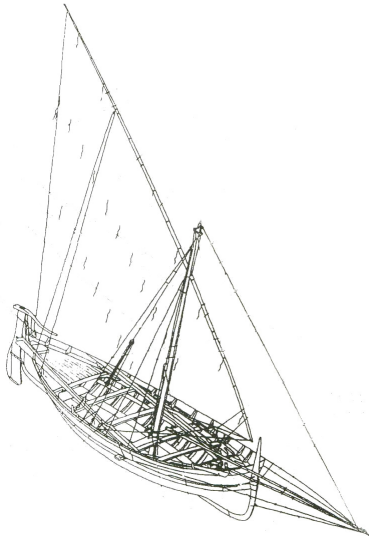


Figure 16: Gajeta “Falkuša”.

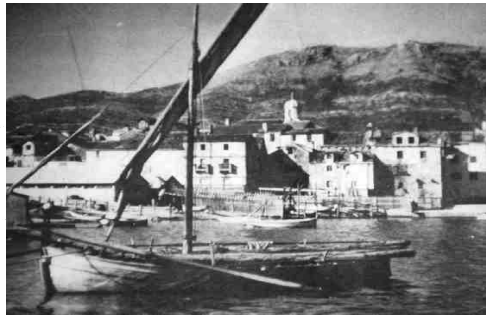


Figure 17: Gajeta.

Launch: it is a motor powered boat of reliable performance and is constructed of best materials, and it is a type suitable for a variety of uses, cruising or just plain pleasure boat. She is convenient in bathing resort of seaside, and will take about 30 persons. Benches along the sides and in the middle accommodate all persons, and may be converted to berths if necessary. She accommodates two members of the crew. The deck is broken at 3 meters from the bow to increase her seaworthiness in the rough sea. The length *L* is about 10.5 meters.

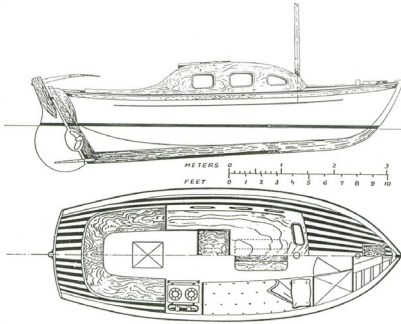


Figure 18: Seasonal cruising boat.

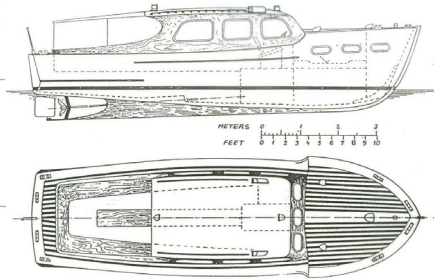


Figure 19: Launch.

Trawler: it is created from keel to mast-head for professional fisherman to go wherever fish appears, in fair or bad weather. Her construction is quite heavy and substantial and assures a good stability in all weather conditions. She contains crew accommodation for 8. Stowage room for fish in insulated from heat. Another wheel is steered from the top of the deckhouse when fishing. Fuel tanks provided for long distance cruising are located on both sides of the engine. The principal dimensions are: L=20.55 meters, B=5.90 meters and d=2.90 meters. Powered by 150 HP Diesel engine, her cruising speed is about 8 knots.

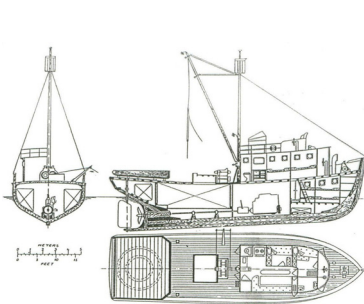


Figure 20: Trawler.

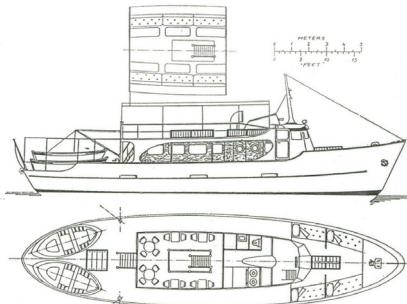


Figure 21: Fishing boat for tourists.

Fishing boat for tourists: this is a smart and well-built boat for cruising and sport fishing. She combines economy, comfort, seaworthiness and speed. There is plenty of deck space, hand rails are installed for safety and stowage place is plentiful. Accommodation is provided for use on extended fishing trips or overnight cruising. Stern hold is entered from the deck and serves for all fishing equipment and ship inventory. All seats may be arranged into 12 beds. In the smoking-room, there are 16 seats and 6 tables. The top of the deck construction is designed for bathing and resting. It allows room for 12 canvas deck-chairs. Crew accommodation is in the bow. She carries four fishing boats placed on

stern that can be lowered by two hand derricks. The principal dimensions are approximately: L=21 meters, B=5 meters and d=1.20 meters. Power is supplied by 150 HP Diesel engine.

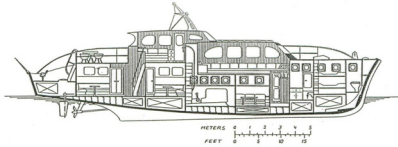


Figure 22: Powered Yacht.

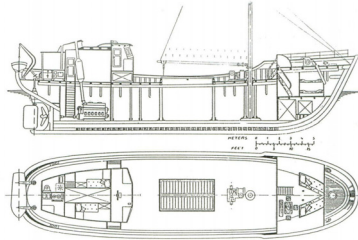


Figure 23: Freighter

Powered Yacht: it is an example of superb construction and workmanship. Her well planned interior affords the utmost privacy. She will accommodate six persons in two separate cabins. Crew's accommodation is provided for four. The yacht is very modern, fitted with Diesel power, electric ventilation, refrigeration, galley and handy cockpit, luxurious stateroom on deck-house, and triple planked bottom with canvas in between. There were two types of yachts: one could take several people in smaller cabins, running over smaller distances, and another had bigger staterooms, berths and more comprising fuel tanks. The later may keep sailing for about 900 Nm without refueling. A handy dinghy is carried on board. The principal dimensions are: L=23 meters, B=5 meters and d=1.15 m.

Freighter: it is an outstanding example of exceptional quality and value. There is so much cargo volume and the mast is used for lifting the cargo and setting an auxiliary rig. The forecandle contains accommodation for crew. Power is supplied by 160 HP engine, with fuel capacity 2000 kg, chief water tank holds 1300 liters while daily fuel tank is of 300 kg capacity. A dinghy 4 meters long is carried by two davits on the stern. The principal dimensions are: L=30 meters, B=7.6 meters, d=3.8 meters and carrying 200 tons burden.

So many wooden boats of Korčula's school have vanished, or ruined during the past days. However, some of these are still "in life" and are used in a good condition [8]:

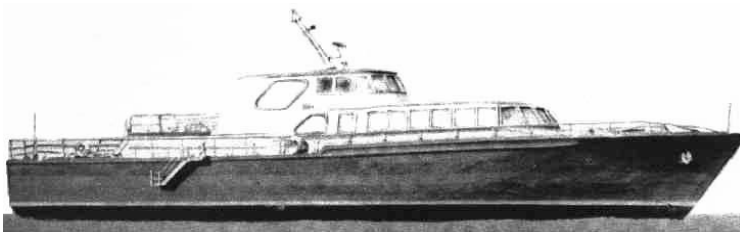


Figure 24: "Podgorka" the wooden yacht built for Josip Broz Tito at 1962.



Figure 25: "Motonave" boat.



Figure 26: The fishing boat on sea.



Figure 27: Pasara.



Figure 28: Fishing boat from bow.



Figure 29: Fishing boat with transom.



Figure 30: Fishing boat underdeck.

3 Conclusion

Two principal characteristics, which have given to the island of Korčula a very important place in shipping during the long shipbuilding history, are a small distance to the Dalmatian coast and dense forests. Those were the reasons that the first navigation had been founded even in the Mesolithic, because this island was very important for providing building raw materials and for an expansion of the Mesolithic's population. The information about shipbuilders' know-how from Korčula, resulted in so many orders for building the new boats, which navigated in the Adriatic and Mediterranean Seas, but some of them navigated even in high oceans. The written data about putting in order Korčula's shipbuilding society were evident in 1214 in the "Statute of the Island and Town of Korčula" in which the relationships of these people towards the sea and the forest can be considered. The "Saint Joseph's Bank" which Korčula's

shipbuilders founded in 1623 for the protection of their interests gives much confidence to these facts, because Venice and the Republic of Dubrovnik had the greatest influence on the development of Korčula shipbuilding, and always made decisions to the detriment of Korčula shipyards. However, that could not prevent people to build and repair their ships in Korčula. How the island of Korčula was interesting for the greatest world powers is shown by the fact that in the XIX century Korčula changed three different governments. A worse life and bad orders resulted into the emigration of Korčula's shipbuilders all over the world, where they founded their new shipyards. After the Second World War the new age of shipbuilding in Korčula started by return of some emigrants. The Croatian War of Independence, with economical difficulty and War risk caused that more orders were placed at the shipyards in the Far East, while the actual Korčula' shipyards ("Inkobrod"-Korčula, "Radež"-Blato, and "Greiben"-Vela Luka), which had had products and the market, were brought to bankruptcy. Only "Radež" survived (got back on one foot).

The long and very successful shipbuilding tradition, a good and unique system of wooden boats construction and a very useful form of realization, different types for all situations of the sea life, give Korčula's shipbuilding "school" the first place in the Adriatic shipbuilding, and undoubtedly one of the highest places in Mediterranean wooden shipbuilding heritage.

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