

Transformation of the outline of Trincomalee - Koddiyar Bay and its vicinity in ancient maps: From Ptolemy to Van Keulen (1st-century CE-mid 18th century CE) *

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Abstract

Trincomalee - Koddiyar Bay is one of the most strategically valuable natural harbours in Sri Lanka which acted as the main gateway to the Kandyan kingdom, as well as to South-Eastern Asia. The harbour and its surroundings were frequently mapped and updated in various maps. When lining up these maps from older to new, it is apparent how the early cartographers updated their maps with new information. If we disregard the famous map of Ptolemy's, it took almost five centuries to appear an accurate map of Trincomalee. The present study is

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focusing on the updates of these maps by comparing them with current geomorphology of the bay. It reveals the names given to the features in the harbour, contemporary uses of it as well as the following geomorphological changes occurred in the harbour such as the emergence of the Tambalagam bay and the concerns of Lac van Condelay or the lake Kantale. Also, through the study, the present authors were able to reveal the "Chart of Albert Cantino of 1502 CE" which marked Sri Lanka accurately in a world map and must be the first-ever reported map of Sri Lanka. Apart from that Trincomalee marked more accurately, it confirms the Europeans had a higher awareness of the Island even before they set their foot on the shore.

"... I have seen among Dutch a fair large map of this place (Ceylon)....very faulty: The ordinary maps in use of us are much more so. I have procured a new one to be drawn...."

Robert Knox:1681

"... That of Triquilimalê is one of the most capacious that there is in the world, and in it, as well as in the Bahia dos Arcos, to which it leads, many thousand ships can anchor in great safety...."

Fernao de Queyros:

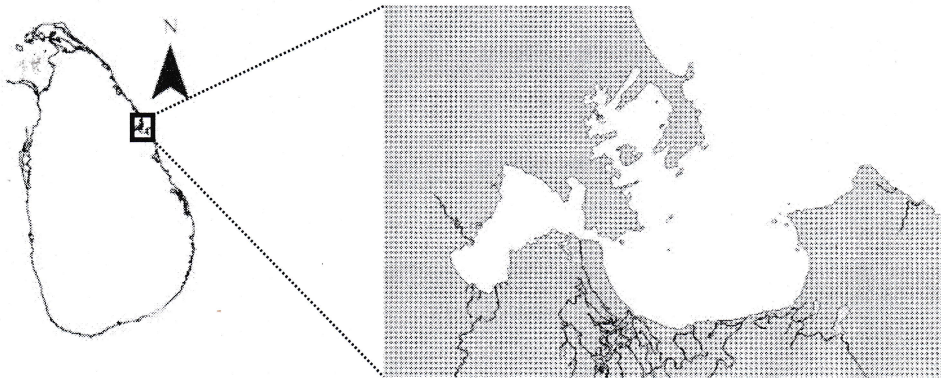
Introduction

Gokanna or Trincomalee, a large natural harbour facing the Eastern and South-Eastern Indian Ocean is considering as the gateway to control the trade empire in the Bay of Bengal, Indo-China and Malayan regions. Its strategic value became apparent since the late Anuradhapura period and was highly active from the 11th - 13th century AD during the Polonnaruwa Kingdom. Since the 15th century, the Europeans as Portuguese, Dutch, British, French and Danish fired their cannons against each at the ports of Sri Lanka and Trincomalee was crucial.

Concerns of the Europeans on the Trincomalee - Koddigar Bay were remarkable. The embassies as Joris Van Spilbergen (1602), Marcellus De Bosehouwer (Baldaeus, 2007, 75,76, 102) and British ambassador John Pybus (1762) used the harbour as a gateway to the Kandyan kingdom. To prevent such communications, the Portuguese constructed a fort on the Pagoda hill in

Trincomalee in 1622 CE (ibid, 144). Dutch captured Trincomalee from Portuguese In 2nd May 1639 CE and later in 1665 Dutch governor, Admiral Rijkloff Van Goens reinforced the fort (Devaraja, 1989, 16) after seeing the English and French fleets in the Indian Ocean. British flags waved over the fort walls from 5th January 1782 for a short period, and in 30th August of the same year, the French captured the fort from the British. French have deserted the fort to Dutch, and finally, on 26th August 1795, Dutch handed over it back to the British by an agreement (Rahula and Udakandage, 1968,78). The British ruled it until 1948 CE. The ventures were able to develop Trincomalee as the most significant naval base in Sri Lanka.

It is needless to say that under these circumstances, the Trincomalee was mapped, illustrated and described by many cartographers. From the Ptolemy's *Taprobana Insula*, the first so-called map of Sri Lanka (originally dated to the 14th cent. AD) the harbour appeared in the maps. The maps produced in the 'age of discovery' of Europe since 15th century as those done by the official cartographers and map makers of the *Dutch United East India Company* (VOC) (Paranawitana & Silva, 2002,1) Trincomalee can identify as a region which usually updated with new details. Studying these maps and charts, provide evidence about increasing value in each period of the port. The primary purpose of this study is to recognize such timely updates done in the maps of Trincomalee by especially concerning its geographical features rather than the fortification and settlements.



Map 01. Study area: Trincomalee. East - West = 30km, North - South = 20 km

Methodology

Unlike the modern Transverse Mercator Projection (TMP) of maps, the early maps of Sri Lanka depicted on different map projections. The adoption of such different map projections on cartography has made it difficult or impossible in sometimes to get on the position of the exact location of the places or to compare them with the present-day maps (Fernando,1995,110). The present study is trying to identify the increasing preference of Europeans to the Trincomalee port by checking the gradual unfolding topography of Trincomalee in maps. The maps are arranged chronological order. All the maps were illustrated the general style of each period accordingly well as the distinct style of each cartographer; consequently, the researchers who attempt to identify the places in the old map have generally adopted to two methods (Weerakkody,1982,18),

- i. Comparison of coordinators and outline of the land with the modern map of Sri Lanka.
- ii. Comparison the names marked in the map

Both of these methods are used here. First, the places marked in the original map are described. Then it is compared with the morphological features in a modern map. Such comparable places marked and described with its common name along with marking them from the letter 'a'-'z' in both maps. Places which can identify with elementary shape are numbered in both maps from '1' to forward and attempts were made to suggest the modern place-name referring to the area. The study is limiting to a region of 30*20km including all islands in Trincomalee bay, part of the land, the estuary of Mahavali River and part of the sea (map 01).

Topography of Trincomalee

Trincomalee holds diverse coastal geological formations such as islands, canyons, points or heads, littoral bays and brackish water bodies, deltaic plains and many such. Geologically it comprises two sections, i.e., i. the undulating plains in *Periyapulau* to *Sinnakinniya* and East *Muttur* to *Kaladichenai*, and

ii. the coast between above two regions with the Holocene beaches and dunes (Swan,1983,10). The whole bay comprised with two harbours as Inner harbour, in the northern part of the main bay, embracing an area of 12 sq.km and enclosed by rocky headlands and islands and the Outer harbour comprising with the Trincomalee Bay and the Koddiyar Bay. The Bay consists of four main points, two at the Koddiyar Bay, i.e. Norway point and Foul point and two at the mouth of the inner harbour, i.e. Marble point and Ostenburg point. There is another seaward protruded point at Fort Frederick known as Flagstaff point. The whole bay is comprised of small coves as China bay, Dutch bay, Shell bay, Back bay, Nicholson's bay, Minden cove, Deadman's cove, Malay cove, etc. Tambalagam bay is significant as it contains brackish water. Great Sober and little Sober are the main islands in the bay, and there are some small islands as Round island, Naditivu, Elizabeth island, Elephant island, etc. (Dewaraja, 1989, 20). The submarine canyon of +40km in length and +3km in depth is one of the prominent geological formations in the adjacent sea (Wijayananda,1985, 216).

Trincomalee - the name

'Gokanna' is the oldest known name for Trincomalee as it referred in the first chapters of the Mahavamsa. Though a place name *Gokannagāma* mentioned in a later Brahmi inscription in the *Ganekanda vihara*, Kurunagala district (Paranavitana, 1970, no.1200), it is not comparable with Gokanna. The earliest explicit record of the name reported from a fragmentary inscription of 13th century CE founded from Trincomalee (ibid, 173) says,

*"Svasti Sri (...) Devas sri coda-gamgah ksiti-tala-tilakām prāpya
Lamkām ajayyām sāke b(d)e (sa)mbnu puspe kriya bhavana Ravana
Haste bhe me(sa) lagne (i....) Gokarnne..."*

Translation: "Hail, Prosperity! In the year sambhu puspa of the sake era, when the sun was in the mansion of Aries, Hasta being the constellation, and the point of the ecliptic at the horizon being Aries. The illustrious

Codagamgadeva, having arrived in the unconquerable Lamka, the forehead ornament of Earth.....at **Gokarnna**...."

Chodaganga, was an Indian prince crowned as a king of Sri Lanka established the inscription in an exact date of 14th April 1223 CE, and it is reasonable to infer that the name 'Gokarnna' was continuously used until that time.

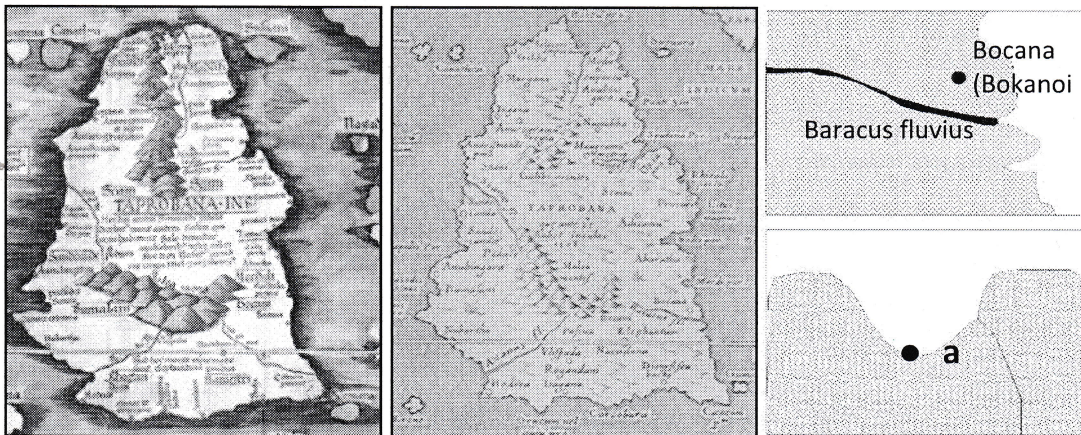
Gokanna was also known as *Sirigonamalaya*, transliterated into the Tamil *Tiruk-kona-malai*, and then anglicized as Trincomalee. 'Trin or tiru' = 'sacred', 'malai' = 'hill', and 'kona' derived from Sinhalese 'Gona'; hence the name thus meaning '*the sacred hill of Kona*' (Paranavitana, 1955,170). The earliest reference to the word 'Trincomalee' comes in a Tevāram of Saiva Saint, Tirujāna Sambandar of 7th century CE mentions a Kovil at 'Tirukkonamalai' (Paranavitana, 1955, 173., HCUC,1964,369). Many transliterated versions as Triqvillimale, Trinquilimale, Trinquamale, Trincomamale, etc. (Table 1) can be seen.

Origin	Name	Period/year
Pali literature	<i>Gôkanna tittha</i>	Anuradhapura era
Sinhalese literature	<i>Gôkanna</i>	Anuradhapura era
Tamil literature	<i>Tirukkonamale</i>	7 th century CE
Spanish	Traganameler	1502 CE
Spanish	Triquilamale	1560 CE
Portuguese	<i>Triqvillimale</i>	1628 CE - 1650 CE
English	<i>Trenkimalay</i>	1681 CE
French	<i>Trinquilemale</i>	1683 CE
Dutch	<i>Trinquilemale</i>	1742 CE
Dutch	<i>Trinkamale</i>	1750 CE
Dutch	<i>Trinconemale</i>	1751 CE
French	<i>Trincomali</i>	1782 CE
English	<i>Trincomalee</i>	since 19 th century CE
Sinhala	<i>Trikunāmalaya</i>	Modern

Table 1 - Names used for Trincomalee in various languages

The first mapping of Trincomalee

The first graphical representation of Trincomalee appeared in the '*Taprobana Insula*' of Claudius Ptolemaios's (ca.90-168 CE) *Cosmographia*. However, it assumes that these maps of Ptolemaio's were actually done ca. 15th century by someone else by based on the Ptolemaio's descriptions (Bandaranayake, 2007, 09). Several updated versions of this map published from time to time (Paranavitana & Silva, 2002, 12) and supposed there are more than 35 editions available. The woodcut print of Martin Waldseemuller (1482) (*ibid*), maps of Lyons M. Servetus (1535) and P. Galignani's maps (1621) in *Tabula Asiae XII* published at Padua are selected to the present study.

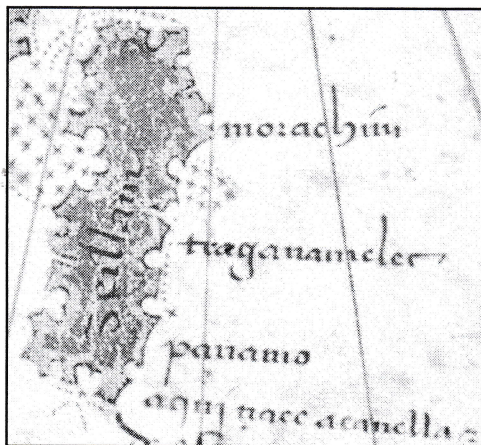


Map 2. Versions of Ptolemy's Taprobane: Lyons Servetus, 1535 CE (left) and P. Galignani, 1621 CE (right) Orientation for 'Nagadibi' the North is right (places marked randomly) Map 3. Bocana and Baracus fluvius in Galignani's Ptolemic map, Map 4. Talacotta emporium in Servetus's Ptolemic map

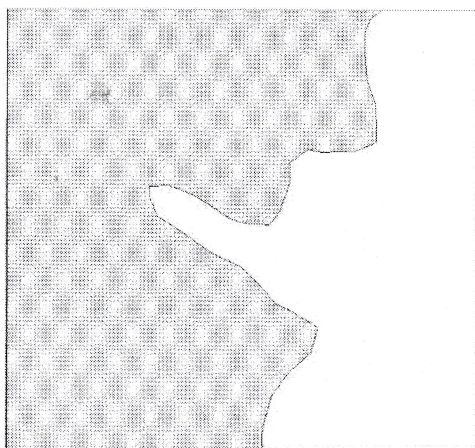
Fernando (1995,113) suggests two approaches to review the Ptolemio's maps, i.e. considering place names separate and then looking into geographical features in the maps. It is widely accepted the accuracy of someplace names mentioned in these maps as '*anurogramum*' (Anuradhagāma), '*margana*' (Magana), '*nagadiba*' (Nagadipa), and so on. A coastal settlement called '*Bocana*' (or *Bokanoi*) (map 3) marked on the left of the embouchure of '*Baracus fluvius*' (River Mahaveli?), a river origin from two tributaries of '*Malea montes*' (Malaya Mountains - central highlands). *Bocana* might

derivate from the 'Gokanna'. However, surprisingly the *Bocana* in the map do not associate a larger bay, which is the significant feature of Trincomalee.

By using the second approach, Fernando identified the 'talacotta emporium' (map 4,a) (talacori emporium in Galignani's version) as Tiriyaya, a small, but an access port in the Anuradhapura period located north of Trincomalee. If so, the estuary and the river marked next to it can be identified as either *Yan oya* or *Kunchikuma aru*, rivers flow near to Tiriyaya. In this map, the river was named as 'phalis fluvius', which comes in later versions as 1621, 'Pnasis fluvius ostia', also identified as Mouth of Mahaveli river (Fernando,1995,113). Actually, Tiriyaya is not a large bay, and on the other hand, Yan oya or Kunchikuma aru are not larger rivers. If follows the Fernando's notion, it is



Map 5. Chart of Albert Cantino, 1502 CE, (in courtesy of Biblioteca Estense Universitaria, Modena, Italy). Orientation : north is up



Map 6. Shape of Traganameler or Trincomalee as in Cantino's

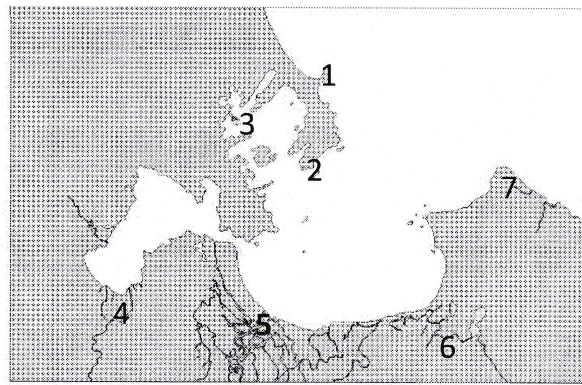
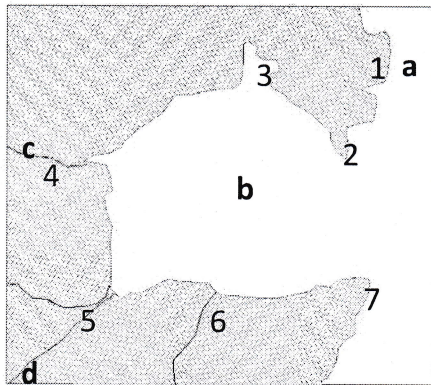
possible to suggest that this Bay, with an embouchure, can be Trincomalee and Koddiyar Bay. It is further supports with another place name called 'moduti empora' which Fernando (1995) identified as Seruwila, marked east to the 'Phalisa'. Seruwila located south to the Trincomalee and Tiriyaya. By turning the map 90° clockwise, all three places are aligning with a modern map. The half-sphere shape of the bay in Servatus's map is clearly changed into a conical shape with more pointed seaward points with the crenulate shore in Galignani's map, which was updated ca. 150 years after the first map. In this map, Koddiyar bay is comparable with the modern maps.

Cantino planisphere (Cantino world map)

Cantino planisphere (Cantino world map) (Map 5) is the earliest surviving chart of Portuguese discoveries. It says the chart was stolen from Portuguese by Alberto Cantino, an Italian agent in Portugal in 1502. Geographical information in the map was based on four series of voyages, i.e. Columbus, Pedro Alvarez Cabral, Corte - Real, and Vasco de Gama followed by Cabral. 'Seillam' (Sri Lanka) marked as an elongated shaped island with three place names at eastern coast, as *Mosaelriiu* (?), *Traganameler* (Trincomalee) and *Panamo* (*Pānama*?). This is the first world map producing the name Trincomalee and can be the oldest reference.

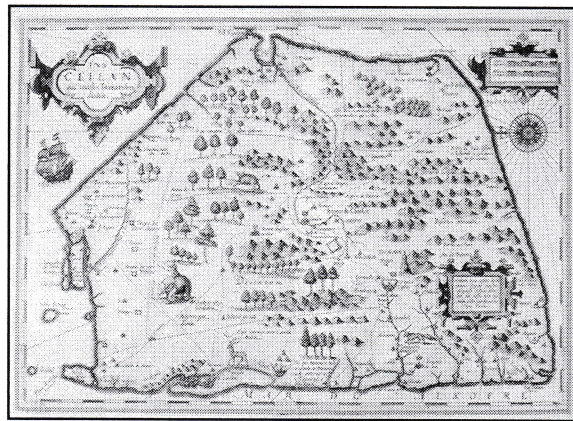
Further, we are proposing this map can be the oldest surviving map of Sri Lanka and not yet published in Sri Lanka. Sri Lanka showed as surrounded by the bays, which mean the abundant anchoring places and harbours. Trincomalee marked with an inlet of bay (map 6), signify the cartographer knew some facts of the region.

Insula Ceilan by Cypriano Sanchez Vilavencio, 1560-65 CE



Map 7. Trincomalee in Sapriano's map (left), with places named in it (in English letters) and places identified with features. Reference map (right)

Insula Ceilan (Map 8) did by Spanish map maker Cypriano Sanchez Vilavencio, (Bandaranayake, 2007,09) and his original map was clarified by the geographer Petrus Plancius. Plancius latterly made his version available to the Antwerp cartographer, Gerardus Mercator (Gerard Kremer), to



Map 8. The map of Sapriano Sanchez, 1560-65 CE, Orientation: North is left (source - Diessen & Nelemens, 2008, 28)

be included in his Atlas. However, this map appeared only after the death of Mercator (1594) and published in 1604 by Flemish-Amsterdam publisher Jodocus Hondius (Diessen and Nelemens, 2008,28).

Sanchez's map is largely schematic but relatively accurate of the Portuguese settlements along the coast, and essential geographical elements in the interior. Hence, this is one of the earliest detailed maps.

Sanchez marked the Trincomalee in the exact location at the estuary of Mahavali. Names '*I de Triquilama*' and '*Triquilamale*' are marked in the bay. The ground is marked with a crown, represents its possession to the king of Portugal, also the first representation of Portuguese settlement in Trincomalee, before constructing a military fort.

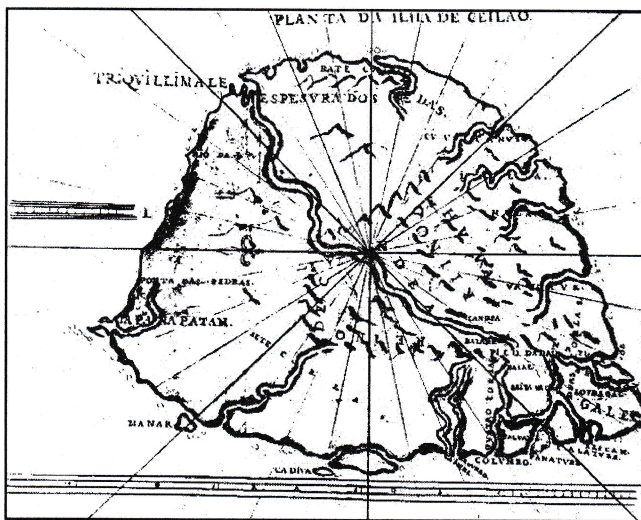
Names in this map (Map 7)

- a. *I de Triquilamale* - Trincomalee
- b. *Triquilamale R.* - Trincomalee bay
- c. *Reino de Triquilamale*- Kingdom of Trincomalee
- d. *Rio de Candea* - River of Kandy, alias River Mahaveli, marked as the origin from *Altanor* (Aluthnuwara) of *Reino de Candea* (kingdom of Kandy).

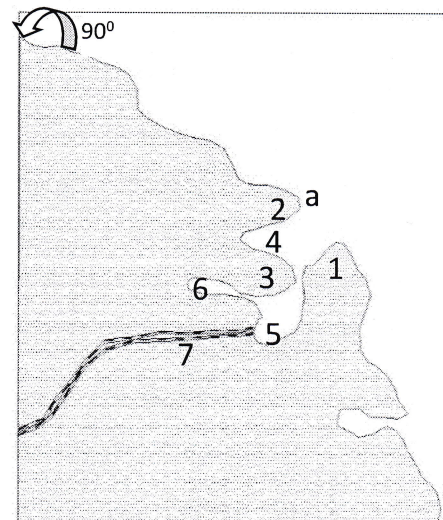
Places (map 07) as Flagstaff point between Back Bay and Holland Bay (1), point of Ostenburgh fort (no port at the time) (2), Inner harbour (3), Peraru river flow into the Tambalagam Bay (4), Coast between Tamareiwilla and Muttur - embouchure of river Mahaveli (5), river and embouchure - river flow from Allei tank (6), Foul Point (7) can be identified with the morphological features.

Early Portuguese maps to Joan van Essen's *Insula Ceilan* (1720)

The outline of the Island changed from a conical to an oval shape in the maps produced in early 17th c and has slight morphological similarities with the modern maps. Portuguese map of *Planta da Ilha de Ceilao* (1628), Spilbergen's map (1603), Petrus Bertius's map (1600-1618), *Insula Zeilan* (1657), Mallet's *Isle de Ceylan* (1683), and Joan van Essen's *Insula Ceilan'* (1720) will discuss here.



Map 9. Planta da Ilha de Ceilao, 1628 CE (source Pieris, 1926, 03) Orientation: North is left



Map 10. Trincomalee in Planta da Ilha de Ceilao, 1628 CE

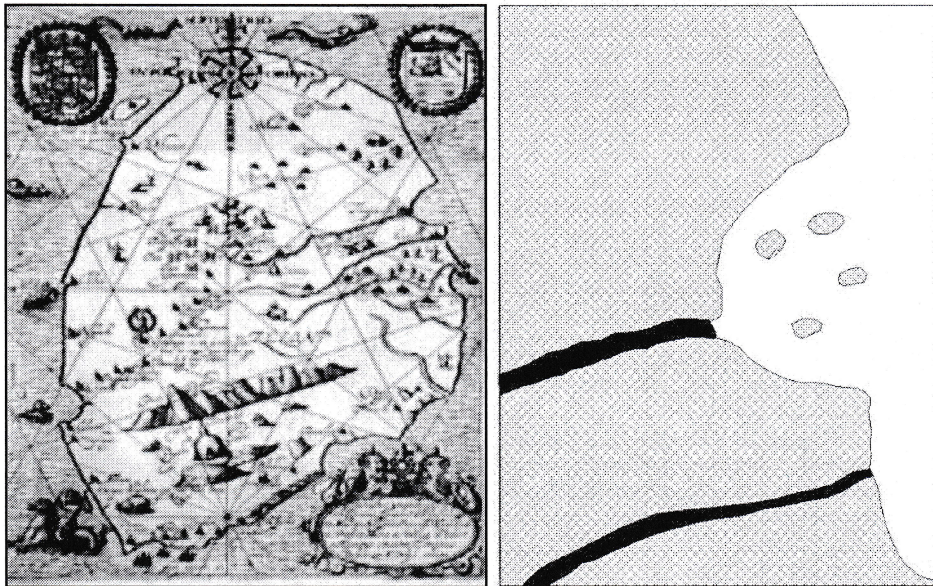
Planta da Ilha de Ceilao (the plan of the Island of Ceylon -1628) is one of remained 25 Portuguese maps of Sri Lanka (Map 9) (Pieris, 1926, 03., Diessen & Nelemans, 2008,30). The basic shapes of the points (map 10) as Koddiiyar (1), Ostenberg (2), Tambalagam (3) and bays as Inner bay (4), Koddiiyar bay (5) and Tambalagam bay (6) can be identified. River Mahvali (7) opens into the Koddiiyar bay, which has its origin at Seitavaca (Seetawaka, but its origin in some versions of the map is marked at Candea (kandy) (Paranawitana & Silva, 2002, 30). 'Triqvillimale' in this map is at the embouchure of a long river (Mahavali). The points at Koddiiyar bay, Ostenburg are shown in simple outline of projection and a little bay near to the left bank of Mahavali, could be the Tamabalagam bay. The shape of Sri Lanka is not comparable to modern, but for the first time, this Portuguese map provides the basic shape of the studied region.

Contemporary to the map, Captain Antonio Martins, a captive of Kandyan king, sent a letter to the king of Spain in 1611-12, and he refers Trincomalee as an essential port to the Kandyan king. He says (Ferguson, 1998,141),

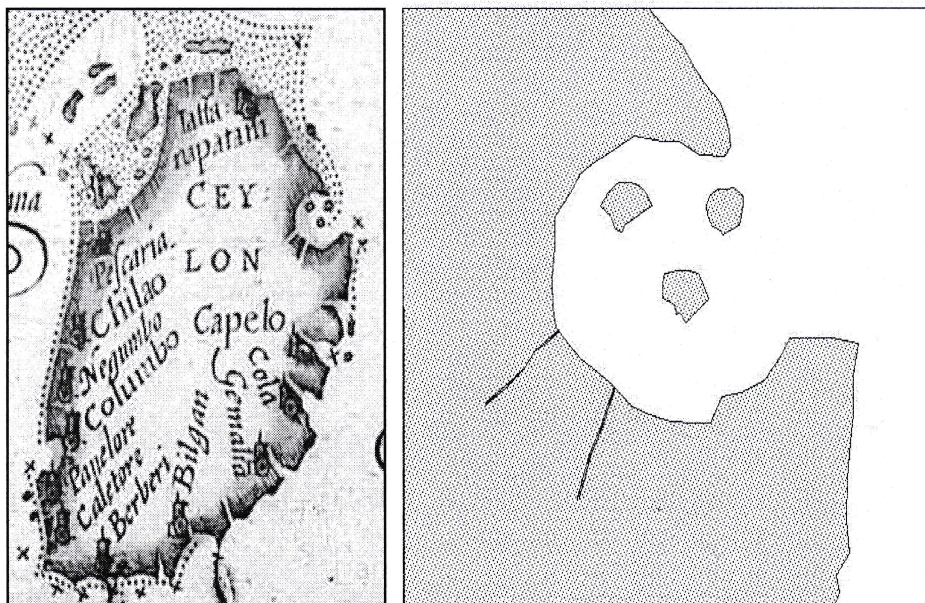
".....towards the South, three ports, where he loads and discharge his goods; one of them called the port of Baticaloa..... And further on, 14 or 15 leagues.....called Trinquilumaleque; and another further on which they call the port Cutiare."

These first records represent the general conceptions of the country existed among the Europeans.

Joris van Spilbergen's 1603 map of Ceylon (Map 11) can be the first Dutch map, and



Map 11. left - Spilbergen's map of Ceylon, 1603 CE (Antiquariaat forum, 66), Map 12. right - Trincomalee in Spilbergen's, 1603



Map 13. left - Ceylon map of Petrus Bertius (Source. davidrumsey.com), Map 14 - right - Trincomalee in Petrus Bertius (1600-1618CE)

likely did by following the Cypriano Sanchez's map, (Brohier & Paulusz, 1951, 14) Portuguese maps as Karte van Ceylon and the map of Bertius, 1600-1618 CE. However, it is not clear whether the map was already at the



**Map 15. Mallet's Isle de Ceylan. 1683 CE ,
Orientation - North is up
(Source - swaen.com)**

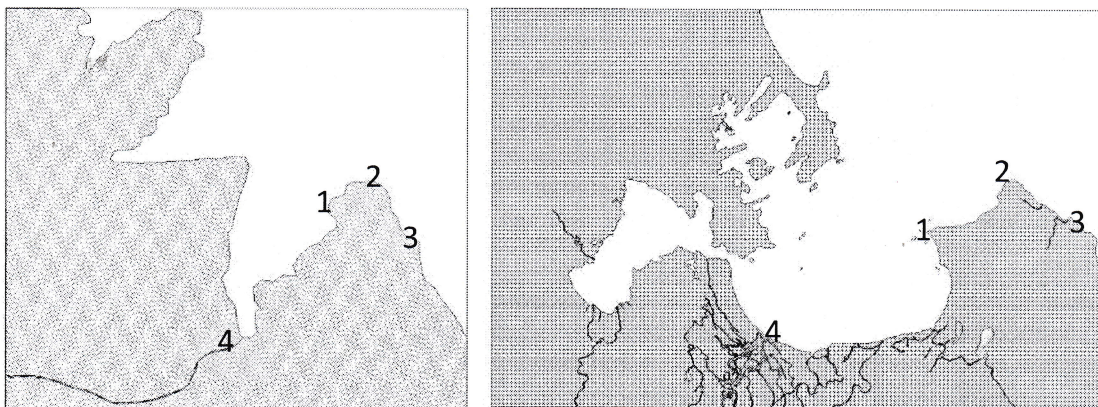
Spilbergen's original journal or was it added latterly in 1617 by M. Colijn (Antiquariaat forum, 66).

Above the inaccuracies, the Trincomalee in Spilbergen's map marked with four islands in the bay. The details of the eastern coast in his map are advanced than the other maps of the period or much later date. Dutch must have gathered ample amount of information through their short embassies.

A similar map did by the Flemish cartographer Petrus Bertius in ca. 1600-1618 (Map 13). The three islands in the map (Map 14), can be identified as the little

Sober Island, Sober island and Island of Elephant. Two embouchures of Mahaweli River are opening into the bay. The details in the map are limited to the coastal region.

Allain Manneson Mallet (1630-1706) a well-travelled military engineer and geographer worked for King Louis XIV of France did Isle de Ceylan (1683)



**Map 16. Triquiliam in Mallet's map (left) marked with identified places.
Reference map (right)**

(Map 15) (Source-www.swaen.com). Mallet's map is an advanced version of Portuguese maps, with oviform - globule shape of Sri Lanka. He indeed used very old Portuguese maps where the *Ceitabaca* (Sitāvaka) or *Cate* (Kotte) are marked imprecisely. However, Colombo, Jaffna, Galle, and Trincomalee are correct for a greater extent.

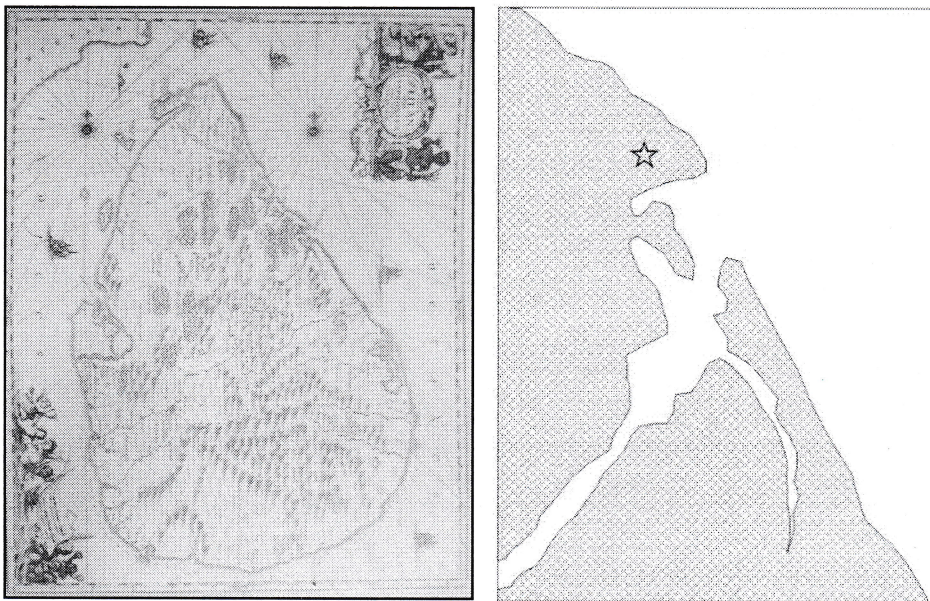
Trinquilam (Trincomalee) is the only name marked on the east coast. River flow from Candea (Kandy) is River Mahaweli. Basic features (map 16) of Koddigar bay are much similar and places as Norway point with Shell bay (1), Foul point (2), Coral point (3) and Embouchure of Mahavali River, at the Muttur (4) (Map 16) can identify with the morphological features.

Though the Portuguese and Dutch mapmakers could get a more excellent knowledge about the coastal region, their maps are much inaccurate about the inland of the country. Robert Knox says he saw a Dutch map at the Dutch for of Colombo while fleeing to England and says it is highly faultier (Knox, 1681, 01),

"....for I have seen among them (Dutch) a fair large map of this place, the best I believe extant, yet very faulty: the ordinary maps in use among us (Britain) are much most so. I have procured a new one to be drawn....."

He could prepare a much details map to the inland of the country, but he still has to rely on Dutch to the coastal area, hence even Knox's map bare the same errors of the coastal region.

The map *Insula Zeilan olim Taprobana* (Map 17) was a revised Dutch edition of Mercator's map and published in Jan Jansson's *Novus Atlas* in 1657. Notes in this map are in Portuguese and some supplementary notes added by Dutch (Paranawitana and Silva, 2002,30). Year of the map and bilingual notes are significant, which is representing the complete transmission of power in coastal Sri Lanka.



Map 17. Map of *Insula Zeilan* in *Novus Atlas* (1657) (left) (Paranawitana & Silva, 2002,30) and *Trinqvilemale* with fort (right, redrawn)

Map of '*Insula Ceilan*' by Joan van Essen (1720) is similar to Mallet's map. The outline and the map title was taken from a printed map in 'Janssonius's *Novus Atlas*', 1657, '*Insula Zeilan Olim Taprobana nene incolis tenarisim*', which in turn is partly based on Portuguese example from about 1630- 1640. Also, several elements have been copied from Joris van Spilbergen's map. Van Essen was an Antwerp map maker, but he only had access to very outdated examples from almost a century earlier (Diessen and Nelemans, 2008,31).

With the VOC cartographers, the image of Ceylon had by then already advanced much further.

The main precise feature in this map is the leg shaped headland between Inner bay and Tambalagam bay. River Mahaweli is flowing directly into the Bay, and the small stream near to the Koddiyar can be the river flow from the Allai tank.

Philippus Baldaeus, 1672 CE to Joannis de Ram , 1700 CE



Map 18. Insula Ceylan olim Taprobana in Baldaeus, 1672 (Paranawitana & Silva, 2002, 31)



Map 19. Trincomalee in Baldaeus, 1672

Phillipus Baldaeus, the chief Predikant of the Dutch Reformed Church in Jaffna in 1658-65 (Paranawitana & Silva, 2002, 31) left a vivid record of Dutch colonial Sri Lanka titled *description of the Great Island Ceylon* (1672) includes a map of Sri Lanka (Map 18, 19). It was a VOC map done by their cartographers. However, it seems he had a personal awareness of the morphology of the Island, at least the coastal regions. His accurate semi aerial drawing of Trincomalee is significantly precise (fig. 1).

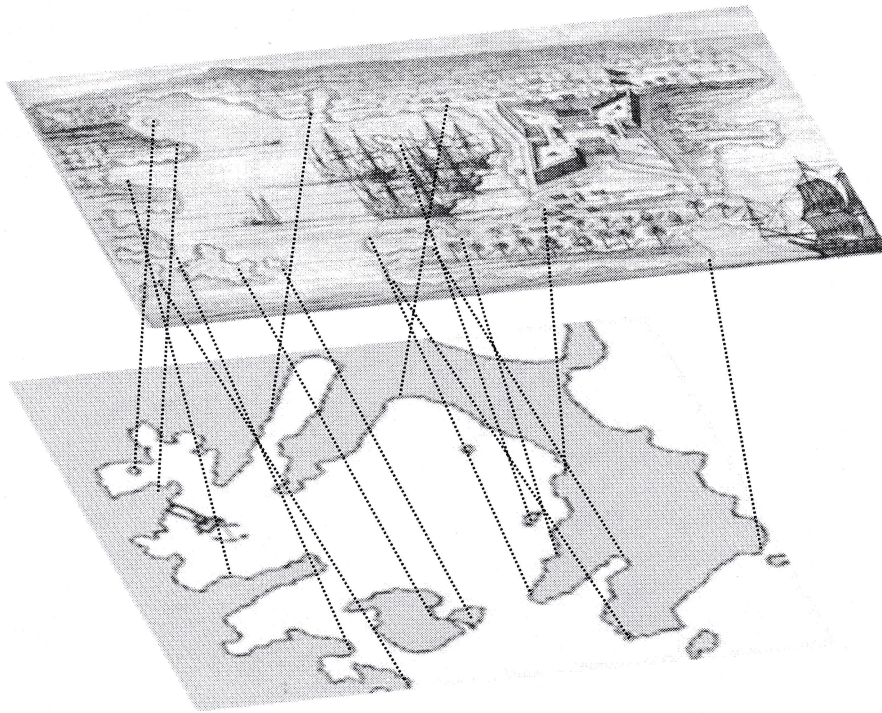
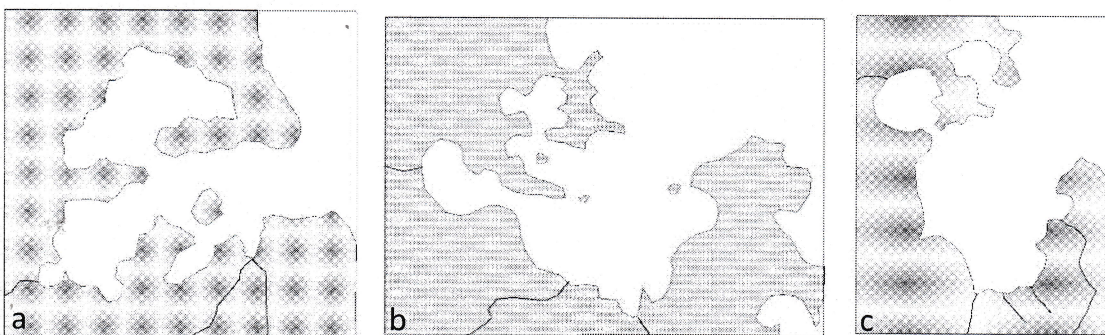
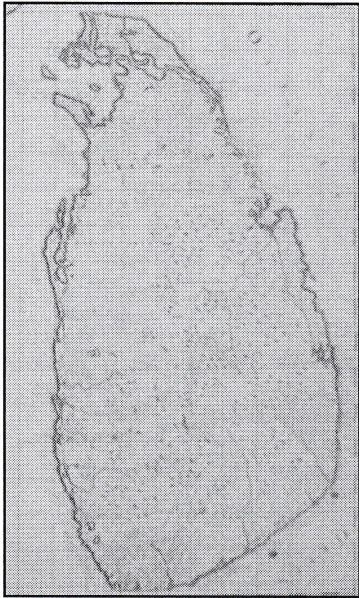


Fig 1. Comparison of Baldaeus's drawing with a modern map

There are some other different VOC maps of Sri Lanka did from the 1680s to 1690s shows different forms of the harbour (map 20- a,b,c).



Map 20. Various outlines for Trincomalee in the maps within ten years, a: Eylandt Ceylon by Johannes van Keulen in 1681 CE, b: Eylandt Ceylon by Johannes van Keulen in 1681 CE, drawn for the use of governor Goens, c: Map of the island of Ceylon by J.C. Toorzee in 1690 CE (redrawn according to Island maps in Paranawitana & Silva, 2002, 34,36, 38)



Map 21. *Insula Ceilon et Madura* by Joannis de Ram in 1700 CE (Paranawitana & Silva, 2002, 41



Map 22. *Trincomalee in* Joannis de Ram in 1700 CE

Johannes van Keulen was the founder of the publishing house of Van Keulen, which produced the most extensive and finest atlases in the last period of 17th century (Paranawitana and Silva, 2002, 35) and the grandfather of junior Johannes van Keulen, the cartographer of a map of Trincomalee which will be the last map considering in this study. Keulen, the elder, has had descriptive information about interior and exterior of the Island, what clearly can see by his detailed maps. In such maps, our region is exaggerated in size (map 20 a). In his map to the west of the region, it is shown a large tank, a canal and its outfall probably can be the tank 'Kantalai'. The outline of this map is similar to the Baldaeus'.

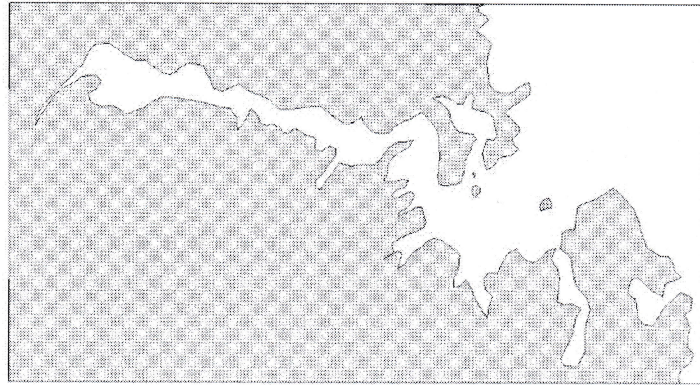
J.C. Toorzee, a Dane surveyor, employed by the VOC in Sri Lanka did a map in 1700 CE (map 20 c). Inner harbour and its covering headlands have some accuracy in its shape, but the width of the bay is very short comparing to contemporary maps.

Dutch timber merchant Joannis de Ram's *Insula Ceilon* (map 21), is accurate for a certain extent. North and Eastern regions of Sri Lanka were marked with shrub forest vegetation. Except for relatively large Jaffna region, the outline of the Island is mostly accurate. It seems his sources were more precise as the bays, lagoons, points marked correctly that the earlier maps (map 22).

Ceylon and Madure 1726 CE to Johannes van Keulen 1750 CE



Map 23. Ceylon and Madurei; anonymous Dutch navigational chart (Diessen & Nelemans, 2008,50)



Map 24. Trincoenmale in the map of Ceylon and Madurei

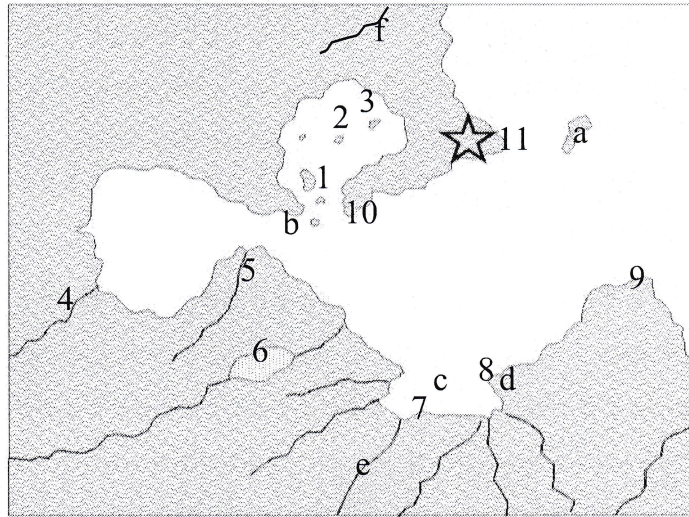
Ceylon and Madure was a Dutch navigational chart (map 23) and seems the cartographer was thoughtful to expose the maritime regions by detailing the coastline, and attempted to emphasis the harbours and river mouths by exaggerating them. For example, Negombo and Colombo in the west coast are marked as coves, more substantial than its actual size and *Panichchankerni*, a small creek in the east coast was marked larger than the Trincomalee bay.

Trincomalee bay, named as 'Trincoenmale' in the map (map 24). A long inland creek runs from Tambalagam Bay, probably long to Halmillawa area. This is also alike to earlier maps of van Keulen. Why these maps showing such a peculiar formation of the water body into the Island. It can assume the cartographers marked the Kantalai tank and its main canal called Par Aru. Dutch had concerns about the location and the size of this tank and cultivable land under it as well as the possibility of reconstructing the tank. In 1793, Engineer Tornbauer addressed the Dutch governer, Jacob Willem van de Graff, by a report accompanied by a chart and emphasized the matter (Brohier, 1934, 17). Thomas Christie in 1802 says (ibid, 18),

"...on the southern side of the lake (Condelye) towards Tamblegamis the only outlet.....the force of the water, broken the wall and



Map 25. Covens and Mortier's Isle de Ceylan, 1742 CE (Source - davidrumsey.com)



Map 26. Trinquilimale in Covens and Mortier's map, 1742 CE

forms a considerable river, which runs in rapid currents towards Tamblegam.... "

Therefore, there is a probability of being the formation can be the Kantale tank and its main outlet flowing into the Tambalam bay. In some of the later maps of Sri Lanka, Kantlai tank and outlet has marked similarly, but with more accurate features as narrow stream and round-shaped tank. Further discussion about marking the Kantalai tank in Trincomalee region will concern in Keulen's map of 1750.

'Isle de Ceylan', (map 25) 1742 CE was a work of Jean Covens and Corneilie Mortier (1675-1726), geographers lived in Amsterdam, who also updated Matthai Seutter's *Ceylon olim Taprobana*, twelve years before drawing their map. The long title of the map is 'map of the Isle of Ceylon' and '*Insula olim Ceilon Taprobana*' is the Latin caption of the map, shows they followed Seutter's map for this new map. They did the map based upon the comments of the Royal Academy of Sciences (source- davidrumsey.com). Portuguese place names used in the map indicate they also referred to some old maps as well.

Though the outline of this map is in an elementary form when compared with the other maps available at the time, the harbour was marked (map 26) with

more accurate details than former maps. Following places are marked in the map.

a - *I.d' Arvoredo Grande*

Portuguese name *Ilha d' Arvoredo Grande* means 'island of large trees'. In Jan Huyghen van Linschoten's description of Ceylon (1595), he mentioned that some of the islands in the vicinity of the bay are whitish from the bird's dung and some are full with trees (Linschoten in Ferguson, 1998, 164). Many ships needed to fit with new masts after stormy journeys, and this Island must be considered as one of the best places to get required trees.

b - *Baye De Trinquilimale ou Dos Arcos*

'Bay of Trincomalee or the bay of Arches'. The word 'Dos Arcos' is the Portuguese word for, 'arches', a curve passageway, represents the horseshoe shape of the inner bay. Queyroz (1617-88), a great Portuguese chronicler, described the 'Bahia de Arcos' is more irregular in shape with divers' islands and creeks, sheltered with all winds and enough for many thousands of ships (Queyros, 1930, 68). The present name is inner Bay.

c - *Baye de Cotiary*

Bay of Koddiiyar.

d - *Cotiary*

Koddiiyar

e - *Mavilgange ou R. de Trinquilimale*

River Mahavali

f - *R. de cutialle*

River of Cutialle (?). A small river flows into a creek, as drawn in the map, but there is no such a significant river to the north of the Bay. Can be a very small stream, called Pan āru, which flows into the Kānniyai lagoon, located ca. 9.5km to north from Osterburg point.

Among the studied maps to this point, this map can regard as the first one that marked the indented coast of the bay, horseshoe shape of the inner bay and the

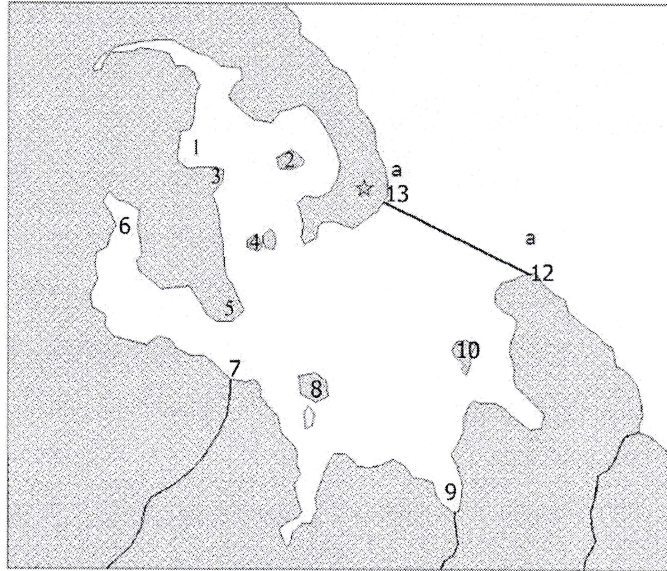
coastal drainage area of river Mahavali. Beside places mentioned earlier, following locations can identify with its features (map 26).

- 1- Great and little Sober Islands
- 2- Island of York
- 3- Powder Magazine Island
- 4- Par Aru flowing into Tambalagam Bay
- 5- Uppu Aru, Pour down to Trincomalee Bay from Siina-Kinniyai and Upparu
- 6- River Mahavali
- 7- Embouchures of River Mahavali at vicinity of Muttur
- 8- Norway Point
- 9- Shell Point
- 10- Elephant's Point
- 11- Chapel Point

Carte de L'Isle de Ceylan 1750 (map 27) was mapped by the French hydrographer and geographer Jaques Nicolas Bellin (1703-1772). Originally published in the '*Hydrographia Francais*', an atlas accompany the general history of travel (*pour server a l' Historie Generale des voyages*) (Dewaraja, 1989, II). The French government had concerns of Sri Lanka at the time. They had chosen Trincomalee and Koddiiyar Bay to get the Kandyan Kingdom and reinforced the forts against the Dutch. If weren't the failures of the leadership, lack of continues supplies or the weaknesses of Trincomalee bay, some events of Sri Lankan history had to be changed.



Map 27. Carte de L'isle de Ceylan of J.N. Bellin's, 1750 CE (source - swaen.com)



Map 28. Trincomalee in J.N. Bellin's, 1750 CE (redrawn)

According to the map, the distance between the Foul point and the Chapel Hill is ca. 8.21 km (scale of the original French map is given in lieue (L) or leagues. (1L=3.25km)) and actual distance is 8.29km between outermost points of the bay (map 28). French's located their troops on both points, during Dutch retreat. Only names of bays are marked on the map as,

Cotjar

- Koddiyar bay

Baye de Trinquemale ou dos Arcos - Bay of Trincomalee or bay of arcs

After their embassies to the court of Kandy, the king granted the operational rights of the Bay of Koddiyar to the French, which they called 'Grande Bay De Cotjar' (grand bay of Koddiyar) (Dewaraja, 1989, 14).

In addition to the above, the following locations can be identified (map 28),

- 1 - China bay
- 2 - Powder rock
- 3 - headland from Neddumkuda
- 4 - little and great Sober Islands
- 5 - Nooroddumunai

- 6 - cove between Sinnamalai and Natchykanda
- 7 - The northern outfall of River Mahavali at Periyakinniya
- 8 - beingless Island - there is no such an island actually, probably this can be an island separated from land by the outfall of river Mahvali at Sinnakinniya.
- 9 - the outfall of Koddaipanchan āru (?)
- 10 - anonymous Island
- 11 - Norway point
- 12 - Foul point
- 13 Chapel hill

An excellent topographical chart of Trincomalee bay (map 29) was drawn by Johannes II Van Keulen (1704-1755) who was the grandson of the Johannes van Keulen (1654-1715) a great Dutch cartographer (Paranawitana & Silva, 2002,2). Junior van Keulen published 'maps of Asian waters', in 1755 (Source - Johannes Van Keulen-Wikipedia) this map may be contained in it or in the 'Seaman's Guide' of Joannes Van Keulen and Jan de Marre of 1753 (Paranawitana and Silva, 2002, 2). The map was mainly used as a navigational chart (ibid, 151). The map was drawn with the contours, the bays, creeks and promontories of the harbour—the hilly coastline with its vegetation marked with usual symbols.

This map is highly descriptive, and many place names are given in Dutch form of original native names or by their names (map 30).

- a - *Hoekran Coetjaar*
Foul point alias Kevuliya
- b - *Wagt huya*



Map 29 . 1750 - Het gedeelte van de cost kust van het eyland Ceylon by Van Keulen (The portion of the coast off the island of Ceylon) (in courtesy of National Achieves Department of Sri Lanka)

The place is comparable with present Muttur East area, where embouchure of Kaddaipanchchan āru located. Meaning or the source of the name is not clear.

c - *Erckelenchea*

d - *Cotiyarr*

Probably the Oopar, a large island at the embouchure of River Mahavali.

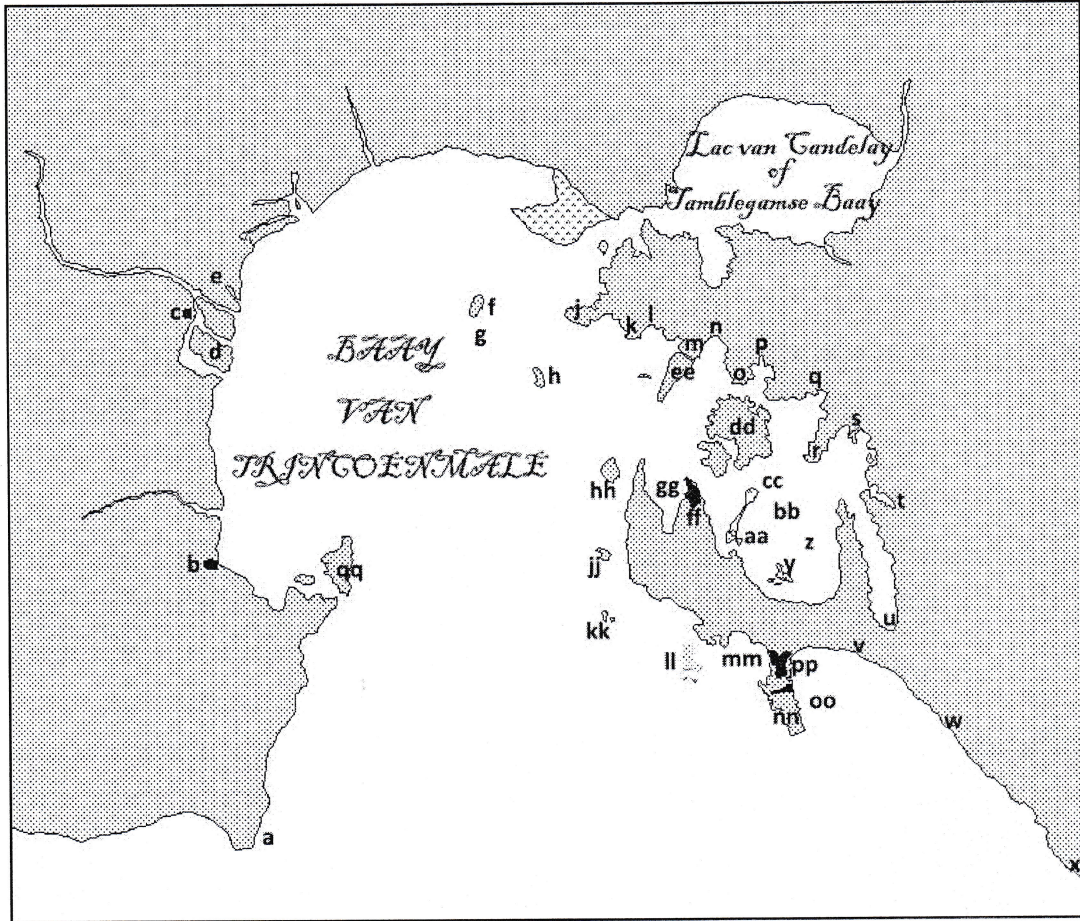
e - *Patienture*

Ichchantivu

f - *Duyre klip*

klip (Dutch) means cliff. Probably a cliff near to the Pigeon Island.

g - *Elisabeths Aanstoot*



Map 30 . Redrawn outline from van Keulen 1750 CE

Meaning of this is not clear. The Dutch word '*Aanstoot*' stand as a noun 'an annoyance', and at the same time, it is a family surname. There are some records about '*Aanstoot*'s in the Netherlands from the 17th century up to now, and some of the women in this lineage has the name 'Elisabeth' (source - www.pondes). In a map of the bay drawn in 1787, name 'Elisabeth' was used to this Island (Paranawitana & Silva, 2002, 149), and can be the present Pigeon island.

h - *kyk indepot*

The origin of this name can be dated to Dutch period, because this name can see at some of their other their colonies, as at Mouille point in Cape Town, South Africa. At this fort, 'Kyk in de pot' was used for name one of five batteries (source- www.mpra.co.za). Also, it can found in Portuguese literature as well (Rickshoffer and Rickshoffer, 1897, 104). The Island named as 'Pot

Island' in a map of 1787 (Paranawitana and Silva, 2002, 149) and the present name is Round Island.

j - *innriekatameene*

Similar to present Nooroddumunai area.

k - *Nagermale*

Diamond hill

l - *Kerremecoetoc koeraa*

The meaning of 'koeraa' couldn't trace. All the 'koeraa's are marked in coves; therefore, this must be a term used by the Dutch for such features. The present name is Karaimalaiyoochuand, and a trace of the above name remains in it.

m - *Pande-arretjemoene*

A small headland at Vellaimanal.

n - *Navaloetoe koeraa*

Clappenberg bay.

o - *Koentje moene*

p - *Tirie koeraa*

Snug cove

q - *Natie Koeraa*

Present Malay Cove. In Dutch 'Natie' mean 'nation'.

r - *Tarremoene*

Neddumkuda

s - *Quaati koeraa*

China Bay.

t - *Oyster baay*

Cod Bay

u - *Modder baay*

In Dutch, *Modder* is 'mud'. 'Mud Bay'. Now, this is known as Yard Cove.

v - *Iakewatiaan*

w - *Mallavile*

x - *Duyre klippen*

Klippen (Dutch) or cliff (reef). Probably a reef is known as Duyre. Present name unknown.

y - *Kraayen eyland*

Powder Island

z - *Narroewettiwe*

aa - *eyland Alabaster*

York Island

bb - *Aggelative*

cc - *dwars in diweg*

dd - *Compagn eyland*

Sober Island

ee - *Klippen*

Full name in the map is illegible due to ink spreading. Modern Clappenburg.

ff - *de berg en'tfort Oostenburg*

Mount and fort Ostenberg

gg - *Pallisaad baay*

Meaning of the name in Dutch is Palisade bay.

hh - *Oliphant eyland*

Dutch *Olifant* means Elephant. The name still in use as Elephant Island.

jj - *Chielle tive*

'tive' probably derived to this map from Tamil 'tivu'. Now known as Chapel Island.

kk - *Nielangkal*

ll - *Brugmans*

mm - *Luyder baay*

Dutch Bay

nn - *Pagodaberg*

oo - *Noorder baay*

Present 'Back bay'. The Europeans strategically valued this. The inner harbour was the main port, which could anchor hundreds of ships. Nevertheless, during the north-east monsoon, strong currents make port

inaccessible, and during the south-west monsoon, strong winds make it difficult to get out of the harbour. Due to this, navy usually anchored their ships in the Back Bay for quick sail (Devaraja, 1989, 20).

pp - *Fort Trincoenmale*

Fort Fredrick

qq - *Noorwegen*

in the Dutch language, this word stands for 'Norway'. The Island marked by Keulen is a large one though present there are only three small islands less than 200m, near to Norway point.

Label - *Lac van Condelay of Tamblegamse Baay*

This label is one of the most critical titles in this map. [Lac (French) = lake, van (Dutch) = of, Condelay (name) , of (Dutch) = or, Tamblegamse (name), Baay (form of baai in Dutch) = bay]. The general meaning of the label is 'Lake of Condelay or Tamblegamse bay'. The second name is certainly the 'bay of Tambalagam'. What is '*Lac van Condeley*'? The same name can found from some contemporary and latter Dutch records. In 1793 Dutch Engineer Tornbauer wrote as follows (Brohier, 1934, 17),

*".....the sworn surveyor of this place M. John Frederick Struys, has surveyed and designed on the accompanying chart, the **lake of Candelay** and the field of it may be irrigate.....the lake is almost entirely natural formation..... Two aqueducts of hewn stones through which the lake discharge itself, are the only artificial aids which the eye can discover. Close to the village of '**Condelay**' the water from the two courses unites itself in a narrow stream and winds through high bushy land between deeply made shores towards the village of Tambalagam lying five hours distant....."*

According to this, Condelay is a large naturally formed water reservoir which was in use once which still can give life and use for irrigating the land.

Also, Thomas Christie, Inspector of the hospitals, who visited Trincomalee in 1802 with governor Frederic North, mentioned about 'Condelay' as follows (ibid, 18),

"...we set out from Tamblegam and arrived at the *lake of Condelye*....."

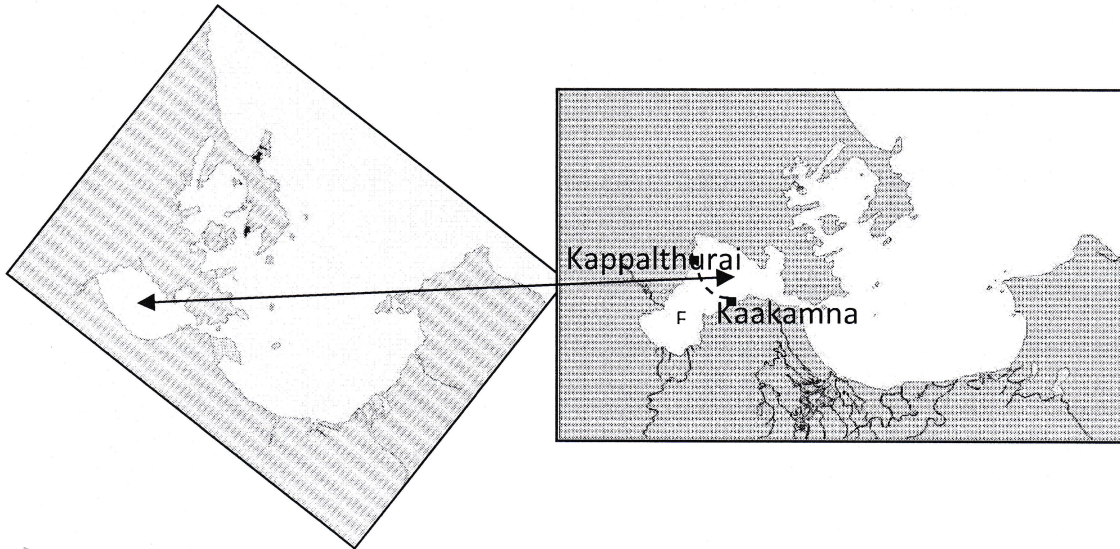
In 1855, Captain Charles Sim of royal engineers named the same lake as '*Kandelly*' (ibid). Indeed, all of them are used the forms of the ancient name used to an enormous irrigation work of Sri Lanka, i.e. '*Kantalai*'. Van Keulen might be informed with the details about a large tank in the region of Trincomalee which its streams were used to irrigate paddy-fields in Tambalagam and flow into the Bay; consequently, it can naturally be confusing about the location of Kantalai tank and Tambalagam bay.

The most exciting concerns can draw with the name and the shape of the Tambalagam bay as marked in the map. None of our previously studied maps contains a label for 'Tambalagam bay'. As we have seen from the Baldaeus (1672) map, the Tambalagam bay at the time was a globular shaped bay. It is comparable with the feature in the Keulen's map. It is different from the present elongated shape of the bay. However, if we cover the southward section (mainly the Kaakamunai lagoon) of the bay from Kappalthurai to Kaakamunai, still this early shape can be seen. Depth of the bay not exceeding ca. 4 ft. at the Kaakamunai lagoon (Siriwardana, 2009, 184) and the vegetation of surrounding is comprised of marshy mangrove forests, but not spreading to the northward.

As we have seen, the Keulen's map is the first standard map of Trincomalee with all certain features. Then why he did not mark the Kaakamunai lagoon and adjacent water body in his map?. Here, I like to suggest the following relate to Keulen's '*Lac van Condelay of Tamblegamse Baay*', with these data.

1. Keulen has probably confused about the location of Kantalai tank and its irrigated lands in Tambalagam with the bay of Tambalagam and thought to mark both names in the map.

2. Possibly the Tambalagam bay has spread more inland since 1750 by a transgression, and a considerable region of the paddy fields at Tambalagam was submerged (map 31). Note the 'F' marked region in the map.



Map 31. Comparison of Keulen and modern map. a. - Transgression of sea since 1750?

Conclusion

In the present study, we have randomly selected some ancient maps from the 15th century (Ptolemy's from 1st Century CE) to 18th century and checked how they could use to study the timely updates and other contemporary details by focusing the one particular region. Trincomalee was selected as it is one of the regions in Sri Lanka which has a continuous use and record from the Anuradhapura period to present.

Though we hypothesis at the beginning that the maps will show a continuous progression of the outline, it was clear that it is not a rapid process. Even after two centuries from the first dated maps, still, in the 18th century, we can see that there were some maps circulated with several errors while some nations have more updated maps. Keeping the maps as a trade secret was one of the success stories of the European trade empires. Those who smuggle such

secrets were badly punished. Therefore, updating the maps and keeping the records should have been handling with higher secrecy, where the accurate maps were not available to everyone. As we have seen from the Baldaeus' semi aerial drawing, the geomorphology of the coastal region might keep as such records.

Neither Ptolemy nor his map editors certainly knew the value of the Bay as a door to eastern countries, but their successor cartographers from Europe realized it soon. From Cantino (1502) now we know that Spaniards had a good record of Sri Lanka and they even knew where to sail to make proper contact with the Islanders. In the view Sanchez's (1560), this was the only main Bay in Sri Lanka and was the path to the Kandyan kingdom. However, the Portuguese made their first contacts through the western coast, and it is reported as an accidental or unplanned visit. Even so, they figured out the strategic value of the Trincomalee as we can see from their maps. However, we do not have remained advanced maps did by the Portuguese for Sri Lanka. Comparing to them, Dutch is relatively ushered in, who took the prime use of coastal region than their predecessors. Through Mortier's (1742) and Keulen's (1750) maps, we can see the increasing uses of the Trincomalee under Dutch governance. VOC even had officially appointed cartographers and surveyors to study and record the regions under their direct authority and attempted to gather as much as data of the inland.

The toponomy of the maps can use as a rich source for the studies in the historical geography. Likely the famous proverb of 'all roads lead to Rome', the first names in the maps of the studied region, clearly states what was the goal of the early fleets arrived at the Trincomalee. '*Rio de Candea*' or the river of Kandy was a road to upcountry from the Bay. Until Dutch establish a fort at Ostenburgh, Kandyan king has a trade port at inner bay, and since then for a while, the possession of Koddiyar was on his hand as a trade port. It was the place where Robert Knox and his crew landed to get a mast and captured by the king's officers. At the time, Sinhalese people used the river as a trade route,

where small boats smoothly sailed. For the larger ships, creeks and little bays provided great anchoring places. Increased awareness of these uses can be seen through the maps.

Apart from the timely updates of the maps and the toponymy, it is clear the maps can be used to study the geomorphological changes that occurred in the past. As we have seen here, an event of coastal transgressions and the submergence of the land is visible in the Kakamunai lagoon of the Tambalagam bay in the Trincomalee bay. Formations of the barrier beaches and ridges, as well as the sedimentations by fluvio-organic processes, are geologically reported, and the history of such processes is revealing from the maps. Some of the changes were natural while some were human-made such as, cast up the sand barriers which once opened and exposed the inner harbour to waves from the east (Swan, 1983, 142). More studies must be initiated by geologists, and it will be an aid to future archaeological studies of the historical geography of Sri Lanka. Europeans started to gather more information on the central highlands of the Island along with their warfare since the mid of 18th century (Brohier and Paulusz, 1951, 14). Compilation of the Sri Lankan mapping was a puzzle which was completed from time to time. In the 2nd August 1800 CE, British colonial government of lowland Sri Lanka established the Survey Department of Sri Lanka and appointed a surveyor-general and other five surveyors (ibid, 15). Most of them were self-trained but performed their duties with massive output. Every single map generated by these individuals is an artefact and still aiding us to understand the way how they saw the world.

Acknowledgements

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