A critical assessment of the genus *Acesta* (Mollusca: Bivalvia: Limidae) in the Indo-West Pacific Ocean, with the description of *Acesta lemuriensis* nov. sp.

a presentation by F. Nolf

Abbreviations:

CFN: Private collection of Frank Nolf (Oostende, Belgium)
CSH: Private collection Steve Hubrecht (Koksijde, Belgium)
D.: Diameter
H.: Height
juv.: juvenile specimen(s)
L.: Length
LV: left valve
MNHN: Museum national d'Histoire naturelle (Paris)
pv: pair of valves
RBINS: Royal Belgian Institute of Natural Sciences (Brussels, Belgium)
RV: right valve
USNM: National Museum of Natural History, Washington DC
v: valve(s)
ZMA: Zoological Museum Amsterdam (The Netherlands)

Systematics

Family LIMIDAE Rafinesque, 1815

Genus ***Acesta*** H. Adams & A. Adams, 1858

Typetaxon: *Ostrea excavata* Fabricius 1779

- Large, thin shelled, ovate, equivalve and inequilateral, ventricose, with moderate byssal gape.
- Anterior umbonal ridge ill-defined.
- Anterior auricle reduced or absent.
- Cardinal area mainly posterior to beak, ligament pit broad, curved (Marshall, 2001).
- Ornament of superficial radiating riblets, commonly strongest laterally and grading into fine striae on median portion of valves

Species of the genus ***Acesta*** live at **great depths** (300-1500 m) and are mostly only known from **scientific expeditions**, while the **literature** is mainly limited to the papers of Bartsch (1913), Lamy (1930), Thiele (1932), Vokes (1963a & 1963b) and the controversial PhD thesis of Stuardo (1968).

The genus *Acesta* contains **worldwide about 30 different species**, half of them in the W and S Pacific. A number of *Acesta* species is poorly known, sometimes only by fragments and their identity is often debated due to vague and sometimes cryptic descriptions or inaccurate drawings.

The overview is limited to species from the Indian Ocean and the West Pacific, present at the **MNHN** (Paris, France, and the private collections **of Steve Hubrecht** and **Frank Nolf** (Belgium).

Subgenus ***Acesta***

- Shells relatively large but comparatively thin, ovate, inequilateral, ventricose, with moderately byssal gape.
- Anterior umbonal ridge ill-defined, anterior auricle reduced.
- Cardinal area mainly posterior to beak.
- Chondrophore with the hinge more or less triangular, curved forward.
- Surface well provided with **radial ribs evenly spaced and equally strong**.

***Acesta arnaudi* F. Nolf, 2022**

(= Acesta sp. 2 fide Huber, 2015)

Type locality: Crozet Islands, French Southern and Antarctic Territories.
Also from Marion Island, St Paul and Amsterdam Islands.

Most important characteristics:

- Shell up to about 100 mm, thin, fragile, **rather glossy**.
- Oval in outline**, slightly oblique** and **rather swollen**.
- Valves white with a shiny appearance, **periostracum very thin and yellowish grey.**
- Fine growth lines in the juvenile growth stage, but very distinct in the older stages of larger specimens.
- Costulation attenuated from the right and left margins towards the centre of the valves, where fine striae are present.

***Acesta* (*Acesta*) *arnaudi* Nolf, 2022**

Crozet Islands, between Pig Island and Possession Island,
French Southern and Antarctic Territories.
46°18-16’ S/51°14-13’ E. Trawled by N.O. “Marion Dufresne” at 1500 m. 15 April 1976.
H. 101.3mm L. 83.0 mm. Holotype. MNHN.

***Acesta* (*Acesta*) *arnaudi* Nolf, 2022**

Crozet Islands, between Pig Island and Possession Island,
French Southern and Antarctic Territories.
52°18’ S/41°44’ E. Trawled by N.O. “Marion Dufresne” at 860 m. 1 September 1980.
H. 90.1 mm L. 69.4 mm. Paratype 1. MNHN.

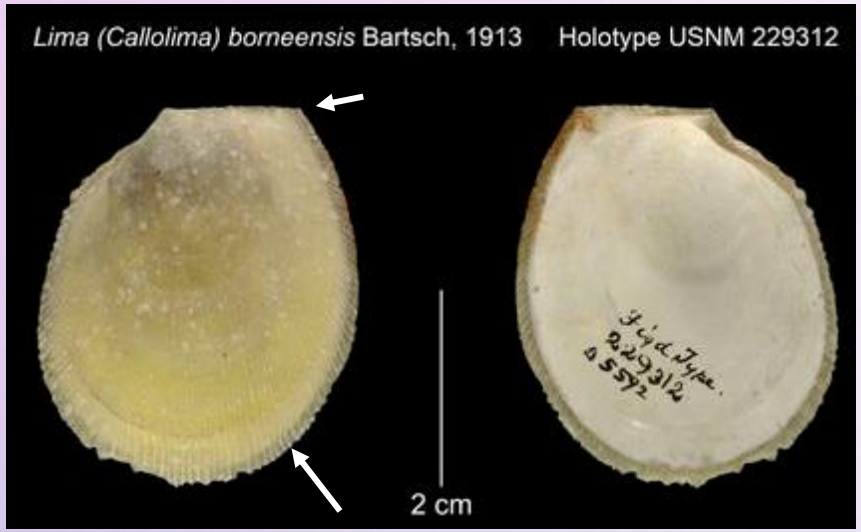
Acesta borneensis (P. Bartsch, 1913)

Type locality: holotype is a young specimen from off Silungan Islet, Borneo (04°12’44” N/ 118°267’44” E). More specimens known from Makassar and Tanimbar Island (Indonesia).

Most important characteristics:

- Shell suboval in outline, up to 130 mm.
- **Valves very thick and solid**, closed at the lunule.
- Inequilateral with **very flattened valves** nearly closed at the byssus gape.
- **Very narrow, elongate hinge**.
- Anterior auricle very reduced and nearly absent, posterior auricle straight on ending in a hooked dorsal margin.
- **Umbonal angle** between the anterior dorsal and the dorsal margin measures 140-142°. Angle between the dorsal margin - which is long and straight - and the posterior dorsal is about 125°.

- Outer surface marked by about **80 sharp radial ribs**.
- These ribs are slightly waving at the top of the disc, later on becoming straight forward, very regular but more prominent in the middle of the disc and are extending beyond the margins, giving them a very sharp aspect.
- In addition to these riblets, the surface is marked by concentric growth lines with stronger ridges at intervals, indicating resting stages.
- **Interstices broad**, becoming wider towards the middle of the shell surface. Interior yellowish white, edged with a yellowish band in juvenile specimens, becoming darker in the adult stage. Colour: **lemon yellow**.



Acesta (*Acesta*) *borneensis* (Bartsch, 1913)

Above: off Silungan Island, Borneo. 04°12’44” N/ 118°27’44” E. In 305 fms, on green bottom. H. 39.2 mm L. 33.0 mm. Holotype USNM (juvenile specimen).
Below: Makassar, Indonesia. 00°31’ N/ 117°50’ E. 595 m. 1 November 1980.
H. 131.1 mm L. 95.0 mm. CFN.

Acesta butonensis (P. Bartsch, 1913)

Type locality: holotype is a small damaged right valve from the south of North Island, Buton Strait, E Sulawesi.

Remarks:

- a very controversial species
- original description similar to that of *Acesta verdensis* (Bartsch, 1913)
- angle between the anterior dorsal and dorsal margin is 150°, a value only observed in *A. verdensis*.
- **Conclusion: until further notice we regard *A. butonensis* as a synonym of *A. verdensis*.**

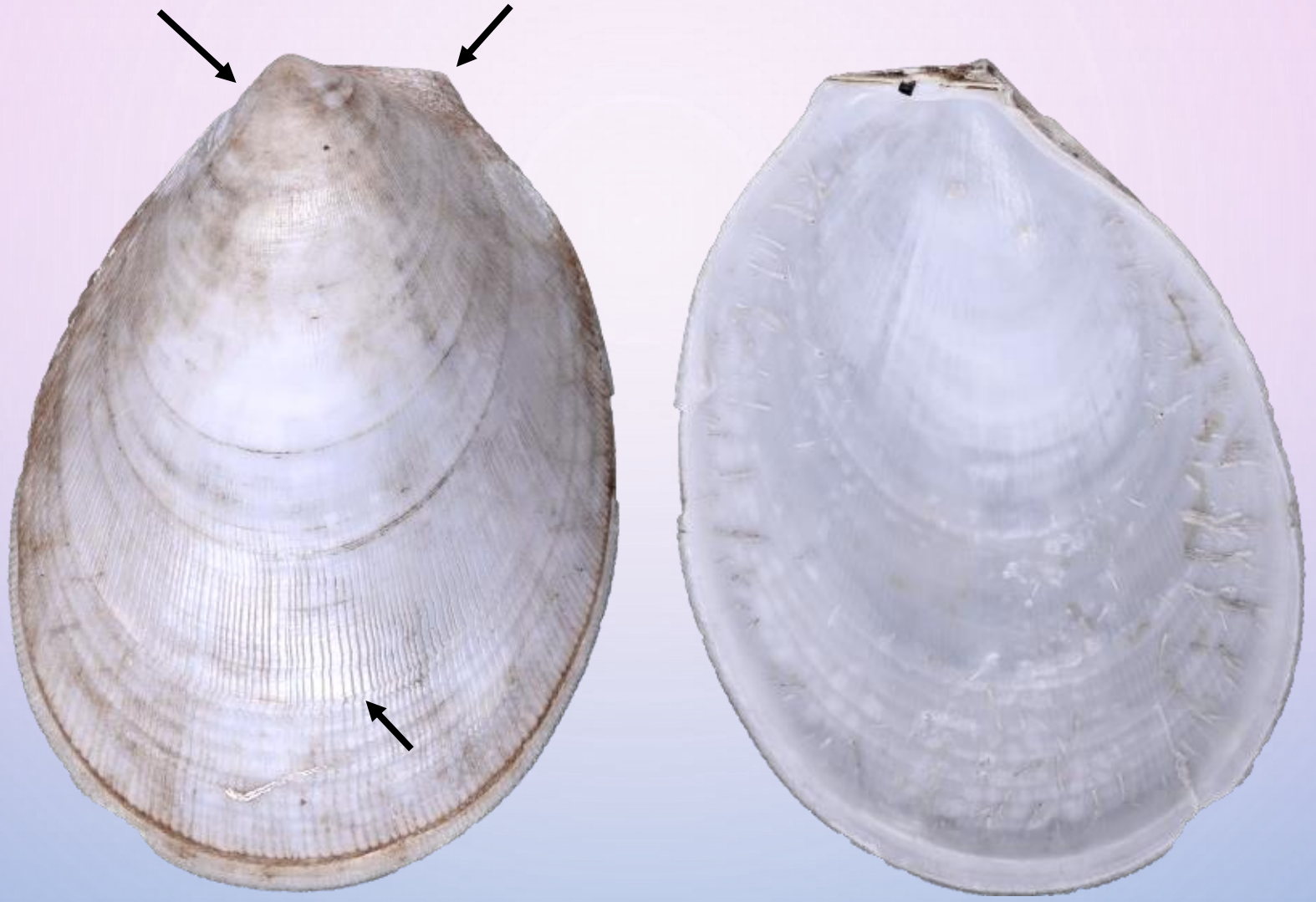
***Acesta* (*Acesta*) *butonensis* (Bartsch, 1913)**
Holotype USNM. S of North Island, Buton Strait.
05°35’00” S/ 122°20’00” E. H. 26.8 mm L. 22.0 mm

Acesta celebensis (P. Bartsch, 1913)

Type locality: south of North Island, Buton Strait, SE of Sulawesi, on the north side of the Flores Sea, Indonesia. 05°34’00”S/ 122°18’15” E.

Most important characteristics:

- Shell **large**, **oval**, with the hinge slightly curved.
- Outer surface marked by **many coarse radiating ribs** which are strongest on the lateral border, particularly on the very strongly excavated lunule.
- **Finer threads** are present in the depressed grooves between these ribs.
- Hinge broad; resilium deeply impressed, wedge-shaped.
- Less bulbous with less strong radiating ribs, spaced from each other by shallow incised grooves in contrast with ***Acesta gabrieli* Nolf, 2022**.



***Acesta (Acesta) celebensis* (Bartsch, 1913)**

SE Point of Manus Island, Papua New Guinea. N.O. “Alis”. BIOPAPUA Expedition. Stn CP3690. 02°14’ S/ 147°16’ E. 611E-618 m. 29 September 2010. MNHN. H. 139.4 mm L. 101.9 mm. LV.

***Acesta (Acesta) celebensis* (Bartsch, 1913)**

Anchorage East of Snilus Besar, Paternoster Islands, Indonesia. 07°19.4’ S/ 116°49.5’ E. Siboga Expedition. Stn 316. Trawled at a depth of 538 m in fine, dark-brown sandy mud. 19 February 1900. Coll. Dautzenberg. RBINS.

Acesta citrina Masahito & Habe, 1976

Type locality: off Esuzaki, Wakayama Prefecture, Honshu, Japan Sagami Bay.

Most important characteristics:

- Shell **rather small** for the genus, sized from 45 mm to 65 mm in length.
- Thin, **elongated ovate** in shape, slightly inflated.
- Anterior dorsal margin short and oblique downwards, posterior dorsal margin short, straight posteriorly, forming a small triangular wing.
- Surface shiny, **yellow**, paler at the umbo and deeper to the margins with distantly placed darker yellowish concentric zones.
- Shell surface with **many wrinkled minute radial striae**.
- Interior smooth and polished, yellow at the margins, which are minutely crenulated corresponding to the ends of the radial striae on the shell surface.

***Acesta* (*Acesta*) *citrina* Masahito & Habe, 1976**

Shizuoka, off Sagami Bay, Japan. Trawled at a depth of 500-600 m.
March 2007. H. 51.2 mm L. 36.6 mm. CSH.

Acesta (*Acesta*) *citrina* Masahito & Habe, 1976
Katsuyama, Chiba Prefecture, Japan. Trawled with gill nets from 250-330 m. 3 December 2006.
H. 52.5 mm L. 37.7 mm. CSH.

***Acesta gabrieli* F. Nolf, 2022**

(= *Acesta* sp. 1 fide Huber, 2015)

Type locality: E Kotakot, Stephan Strait, Papua New Guinea.

Most important characteristics:

- Shell up to 150 mm.
- Valves **rather inflated**, **slightly anteroventrally oblique**, glossy white.
- Posterior auricle hooked, not rounded.
- Exterior surface of the valves sculptured with about **110 flattened radial ribs** of equal strength, broader than the interstices and extending beyond the margins.
- Often been confused with ***A. celebensis*** in literature, but is different by its impressive ribs, with **very deep interstices**, **visible from the interior side**.
- **Angle** between hinge plate and anterior margin about **25° larger than** within ***A. celebensis*** (Bartsch, 1913).

***Acesta* (*Acesta*) *gabrieli* Nolf, 2022**
Tanimbar Islands, Indonesia. 08°44’ S/ 134°05’ E.
H. 151.8 mm L. 114.1 mm. CFN.

***Acesta* (*Acesta*) *gabrieli* Nolf, 2022**
E Kotakot, Papua New Guinea. 04°24’ S/ 149°34’ E. N.O. “Alis”. PAPUA NIUGINI Expedition. Stn CP4038. 17 December 2012. Trawled at a depth of 800-840 m.
H. 70.02 mm L. 54.41 mm. MNHN.

Acesta goliath (G.B. Sowerby III, 1883)

Type locality: Japan.

Most important characteristics:

- Shell **obliquely ovate**, semitransparent, striated at the sides and on the auricles, otherwise smooth.
- Anterior side with a **depressed lunule**, making a **straight outline** extending from the umbones about half the length of the shell.
- Cardinal area deeply excavated.
- Anterior auricles small and very sloping, posterior auricles large.
- Colour: white.
- Size: from 100 mm to a maximum of 176 mm.

***Acesta* (*Acesta*) *goliath* (G.B. Sowerby III, 1883)**
Aomori, Okuki, Japan. Trawled in very deep water.
2009. H. 135.7 mm L. 101.2 mm. CSH.

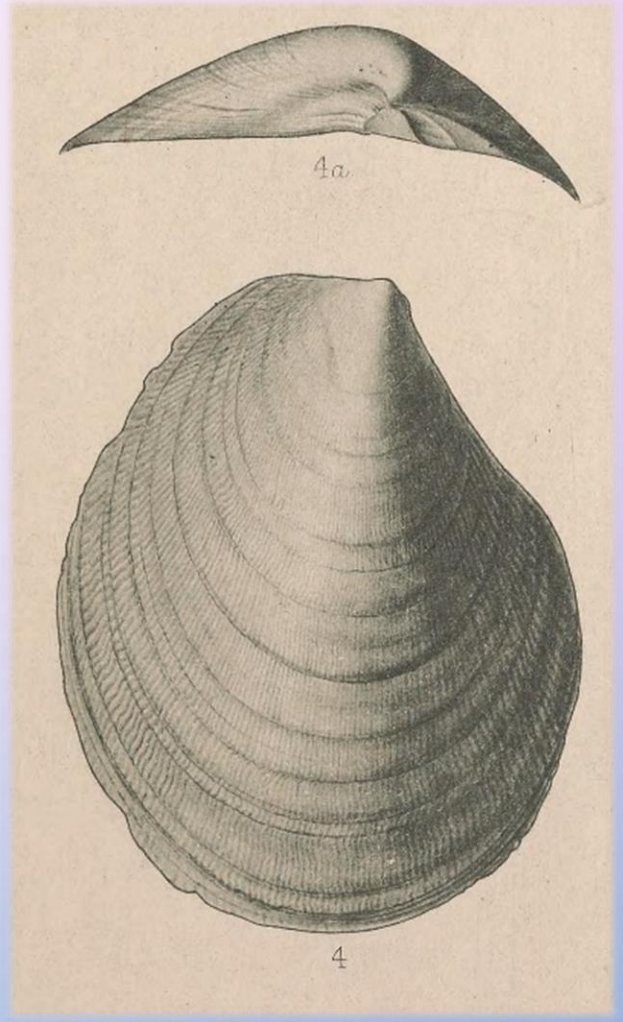
Acesta indica (E.A. Smith, 1899)

Type locality: off Travancore coast, India.

Most important characteristics:

- Shell moderately large, with the
- Anterior margin convex in its upper part.
- About 40 distinct radiating ribs over the whole surface of the shell with marked growth stages.

Remark: *Acesta indica* remains a rather mysterious species, only known from a few specimens in a not-well defined geographic distribution area.



Pl. XIII, figs 4,4a from Illustrations of the Zoology of the Royal Indian Marine Survey Ship “Investigator” under the command of Commander W.G. Beauchamp, R.I.M. Mollusca, Pt. VI by Alcock, 1907.

Acesta maui B.A. Marshall, 2001

Type material: North Island, Cook Strait and South Island, SE Campbell Island, southern New Zealand, Chatham Rise, Bounty Platform and Campbell Platform.

Most important characteristics:

- Shell up to 185 mm high, **elongate**, thin, glossy, translucent, white, moderately inflated, strongly inequilateral, **very anteroventrally oblique**.
- **Periostracum thin**, **brown**, covered with **minute spines** that rise from stellate bases, most of which are grouped in roughly commarginal lines.
- Exterior sculptured with numerous low, **rounded radial riblets** that become stronger towards the margins, covering the whole disc, but becoming **entirely absent** from **median area**.
- **Interspaces** with much finer, closer, **commarginal riblets**.

***Acesta* (*Acesta*) *maui* Marshall, 2001**

Chatham Rise, New Zealand. Trawled at a depth of 450 m. December 2002.
H. 165.8 mm L. 119.1 mm. CSH.

***Acesta* (*Acesta*) *maui* Marshall, 2001**

Chatham Rise, New Zealand. Trawled at a depth of 500 m on the side of a canyon wall. H. 100.8 mm L. 69.6 mm. CSH.

***Acesta* (*Acesta*) *maui* Marshall, 2001**

Off Beachport, South Australia. Trawled at a depth of 120 m. On sandy bottom. 1990.
H. 112.7 mm L. 86.7 mm. CSH.

A. maui is **comparable** with ***A. patagonica*** **(Dall, 1902)**, to which it is most similar in hinge height relative to shell height, and shell thickness, shape and proportions.

A. maui differs in having weaker, more closely spaced radial ribs on the anterior and posterior thirds. These ribs are practically absent in the mid part of the disk creating a shinier appearance of the shell surface.

Animals of both species are **externally very similar** (Marshall, 2001).

***Acesta* (*Acesta*) *patagonica* (W.H. Dall, 1902)**
Off Quintero Island, Chile.
Trawled at a depth of 350-400 m. August 1992.
H. 90.5 mm L. 68.0 mm.
CSH.

***Acesta* (*Acesta*) *patagonica* (W.H. Dall, 1902)**
Bahia Parry, Seno Almirantazgo,
Magellanes Strait, Chile.
Taken in a crab trap at a depth of 80 m.
January 2016.
H. 83.7 mm L. 66.3 mm. CSH.

Acesta saginata B.A. Marshall, 2001

Type locality: Chatham Rise, New Zealand.

Most important characteristics:

- Shell up to 116 mm high, rather thin, inflated, distinctly anteroventrally oblique, glossy white.
- Dorsal margin straight behind small umbones, set off from posterior margin by distinct angulation.
- Posterior margin more broadly rounded than the anteroventral margin.
- Exterior sculptured with about **100 ribs**, stronger and most widely spaced on anterior and posterior sides.
- Rib interspaces with fine, crowded, **commarginal threads**.
- **Angle** between hinge plate and anterior margin is about **10° less** than in ***A. gabrieli* Nolf, 2002**, a more anteroventrally oblique shell, with a very narrow hinge plate.

Important remark:

The **paratypes from New Caledonia**, identified by **Marshall** as *Acesta saginata* (MNHN), are definitely **not that species**.

In contrast with the New Zealand specimens, shells from New Caledonia possess **only obsolete radiating threads** instead of distinct ribs and the **hinge plate is also different**. We suppose that the **New Caledonian specimens** belong to another **undescribed species**. As only single valves and fragments in bad condition were present, a description has not been pursued.

***Acesta* (*Acesta*) *saginata* Marshall, 2001**

Chatham Rise, New Zealand. Trawled at a depth of 1000 m. December 2000.

H. 65.7 mm L. 50.8 mm. CSH.

Acesta* cf. *saginata

Off Crozet Islands. Kara Dad shoals. Dredged by N.O. '*Marion Dufresne*'. 46°20' S/ 42°28' E. H. 83.73 mm L. 64.44 mm. MNHN.

Acesta* cf. *saginata

SW of Ile des Pins, New Caledonia. N.O. “Cyana”. CALSUB Expedition. 22°53’ S/ 167°23’ E;

Left and center: Stn PL20. Trawled at -606 m. 13 March 1989.

Right: Stn PL20. Trawled between 555-616 m. 10 March 1989.

***Acesta verdensis* (P. Bartsch, 1913)**

(= ?*Lima butonensis* P. Bartsch, 1913)

Type locality: the Philippines. Also known from the Solomon Islands.

Most important characteristics:

- Shell moderately large, from 50 to 120 mm.
- Irregularly outline from **oval to nearly circular**, slightly gaping at the lunule.
- **Central part of the disk** is **almost smooth**.
- Hinge slightly curved, extending very slightly anterior to the beaks.
- **Lunule strongly developed** and deeply impressed, often showing an **indentation** in the **right valve**.
- **Angle** between the dorsal and anterior dorsal margin measures about 145-150°, larger than in any other *Acesta* species living in the same waters.

Left: *Acesta* (*Acesta*) *verdensis* (Bartsch,1913)
Holotype USNM. Off Sombrero Island, Philippines. 13°45’05” N/ 120°30’30” E. H. 48 mm L. 40.4 mm.

***Acesta* (*Acesta*) *butonensis* (Bartsch, 1913)**.
Holotype USNM. S of North Island, Buton Strait. 05°35’00” S/ 122°20’00” E. H. 26.8 mm L. 22.0 mm

***Acesta* (*Acesta*) *verdensis* (Bartsch, 1913)**

NW Santa Isabel Island, Solomon Islands. N.O. “Alis”. SALOMON 2 Expedition. 07°43.9’ S/ 158°27.7’ E. H. 73.0 mm L. 63.36 mm. MNHN.

***Acesta* (*Acesta*) *verdensis* (Bartsch, 1913)**
New Ireland, Papua New Guinea. N.O. “Alis”. KAVIENG 2014 Expedition. 02°24’ S/ 149°59’ E. H. 114.8 mm L. 100.2 mm. MNHN.

Subgenus *Callolima*

Ligament and the chondrophore more or less oval, elongated in the direction of the hinge plate and with **superficial radiating riblets, commonly strongest laterally and grading into fine striae on median portion of valves**, sometimes nearly completely absent in the middle of the disc.

Radial ribs of equal width not alternating with secondary finer riblets. Anterior auricle present, but sometimes very reduced.

Acesta marissinica Yamashita & Habe, 1969

Type locality: East China Sea, off Amami Oshima, south of Kyushu, Japan. Also known from the South Chinese Sea.

Most important characteristics:

- Shell **very large**, attaining **about 210 mm** in size.
- Thick, moderately inflated, **triangularly ovate** and **even quadrate ovate**.
- **Byssal gape** with **thickened edges** and a straight anterior margin.
- Umbo situated at the anterior end of dorsal margin and slightly beyond it.
- **Lunule** small but distinctly marked with lamellated growth lines and coarse incised radial grooves.
- **Anterior margin** is slightly curved and the posterior gently to roundly arcuate.
- Ventral margin rounded and dorsal margin straight, forming an angular corner with the posterior margin.

- **Ligamental area** between the dorsal margins deeply slanted, narrow and long.
- **Resilifer groove** grows from the anterior umbo to the middle part of the ligamental line.
- Hinge plate narrow. Excavation between the lunule also deeply slanted, but not sinuated on the anterior margin.
- Surface with many **radial, weakly waved ribs**, lunule with very strong cords.
- Colour from deep **yellow** to ashy yellow.
- **Interior** shiny, glossy white, but slightly yellow at the umbonal area, diffusing to the ventral margin.

Remarks:

Thach (2015) states that the narrow, radial ribbing in ***A. kronenbergi*** is more distinct than in ***A. marissinica*** and ***A. rathbuni***.
In fact, *A. rathbuni* possesses only obsolete threads (limited to the anterior and posterior parts of the disc), and the **sculpture of both *A. marissinica* and *A. kronenbergi* is identical**. They **both** have a **quadrate-ovate shape** and a **byssal gape with very thick edges**, whereby they differ from all other similar *Callolima* species like *A. rathbuni* and *A. niasensis*, and certainly *A. philippinensis* and its synonym *A. bartschi*.
Thach made no comparison with ***A. niasensis***, a species closely related to *A. marissinica* and therefore also to *A. kronenbergi*.

Conclusion:

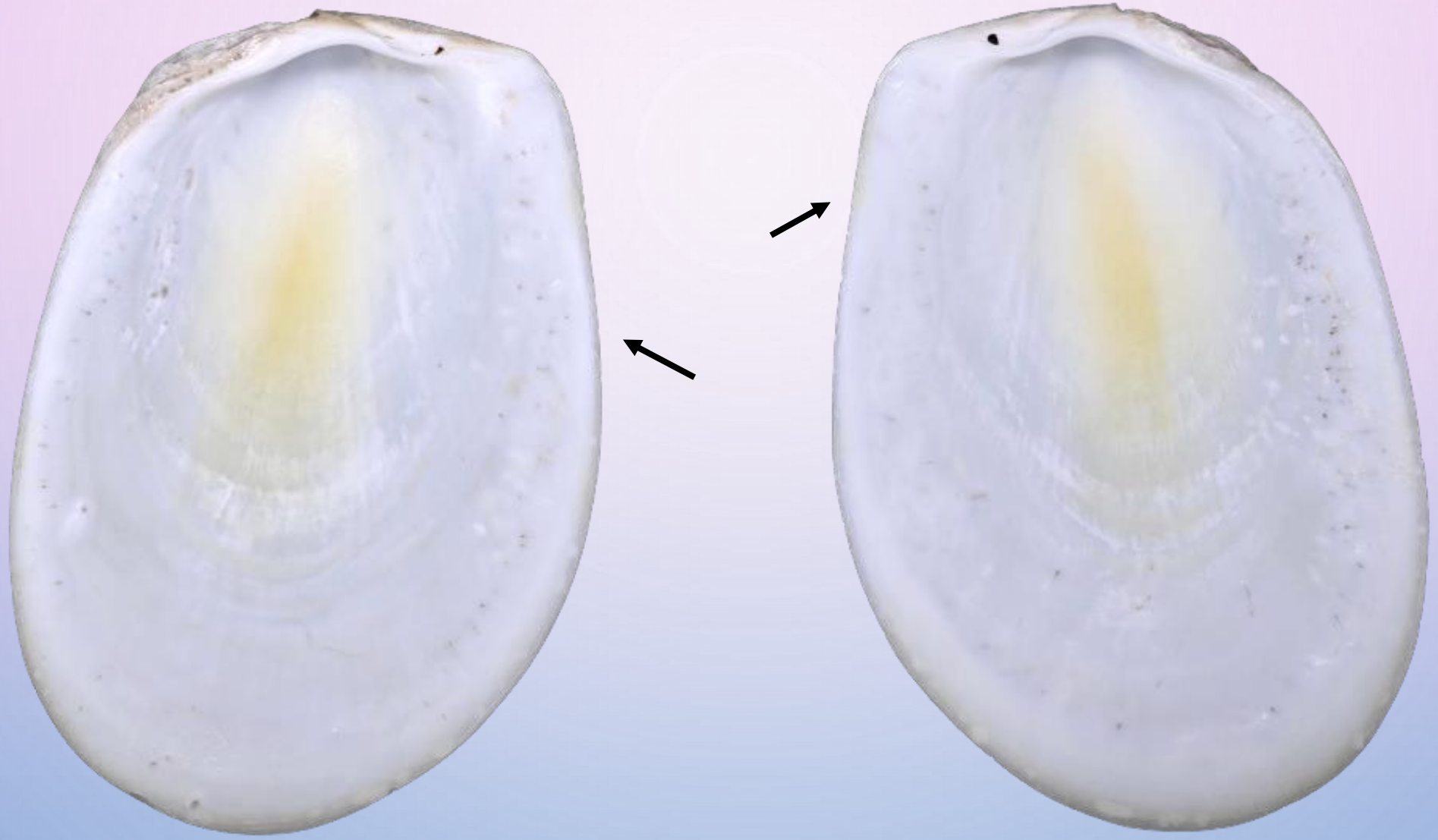
We state that ***A. kronenbergi*** and ***A. marissinica*** occur in the same waters of the West Pacific and cannot be differentiated from each other because they possess the **same characteristics**, such as the thick edges of the byssal gape, the quadrate-ovate outline and the nearly straight anterior margin whereby they **differ** from ***A. rathbuni*** (more ovate, no thickened edges at the lunule, more globose, only obsolete threads and lateral sides, more glossy), ***A. niasensis*** (radial ribs wavy and more impressed at irregular distances) and finally ***A. philippinensis*** with its very oblique outline and fragile light-weighted shell.

***Acesta kronenbergi* Thach, 2015 has to be regarded as a junior synonym of *A. marissinica*.**

***Acesta* (*Callolima*) *marassinica* Yamashita & Habe, 1969**
(= *Acesta kronenbergi* Thach, 2015). Holotype.
Fig. 2 from *Venus*, **27**(4).

***Acesta* (*Callolima*) *marassinica* Yamashita & Habe, 1969**

Off Nha Trang, Vietnam, South China Sea. Taken by nets at a depth of 300 m. 2000.
H. 194.3 m L. 135.6 mm. CSH.



***Acesta* (*Callolima*) *marassinica* Yamashita & Habe, 1969**

Off Nha Trang, Vietnam, South China Sea. Taken by nets at a depth of 300 m. 2000.
H. 194.3 m L. 135.6 mm. CSH.

***Acesta* (*Callolima*) *kronenbergi* Thach, 2015.**
Offshore, SE of Nha Trang City, Khánh Hòa Province, central Vietnam.
Paratype. MNHN.

Acesta niasensis (Thiele, 1918)

Type locality: Nias Strait, off SE Sumatra.

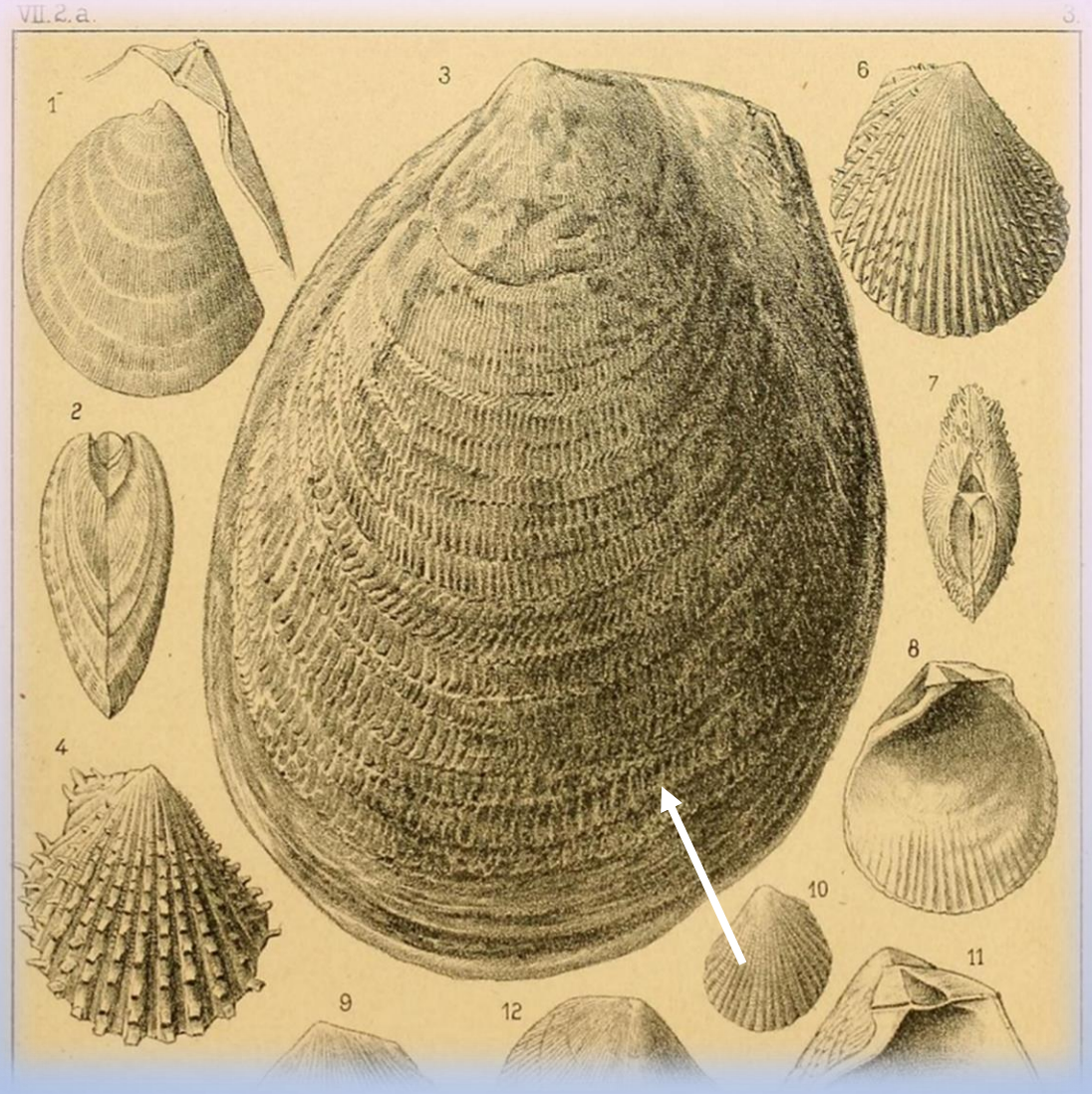
Most important characteristics:

- Shell moderately thick, slightly sloping, **flat arched**.
- From the rather long edge of the ligament zone, the dorsal margin drops **obliquely**, in the beginning almost in a straight line and then merges into the broadly lower edge.
- **Margins broadly rounded below**.
- Anterior auricles very reduced.
- Entire surface covered with **numerous rather flat and close-fitting wavy radial ribs**, which are **more or less kinked** at some growth marks and are broader than the interstices.
- Colour **lemon-yellow**. Interior white to pale yellow.

Remarks:

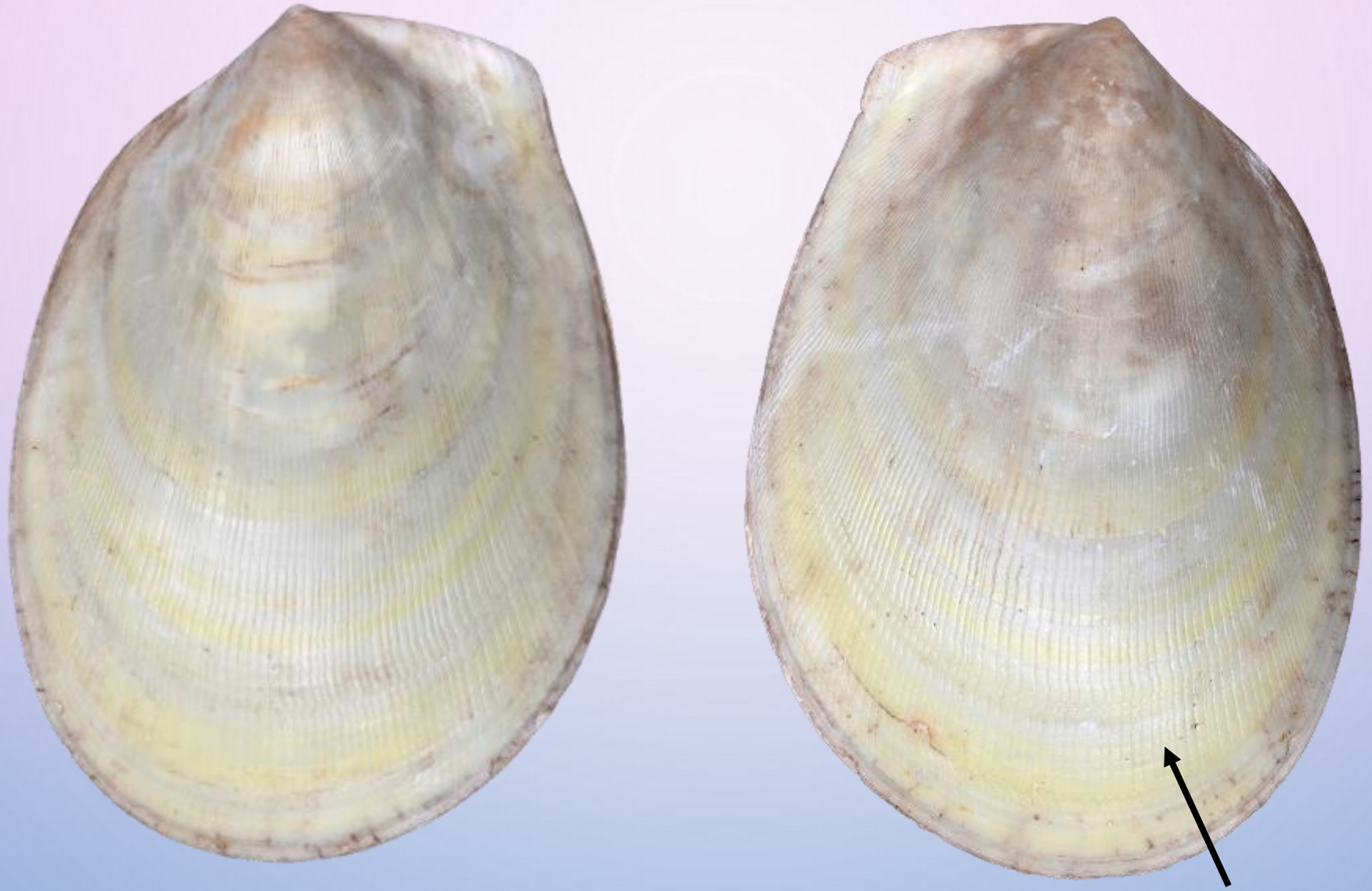
This species is **poorly known** and **practically absent in the literature** of the last century.
In fact, it is only figured by **Thiele** (1932) and **Stuardo** (1968), who depicted again the **type**. **Only one specimen was known until today**.

Acesta niasensis* is different from *A. rathbuni by the thickness of the valves and its outline, being broader in the middle part of the disk and rounder below, in contrast with *A. rathbuni* which is slightly oblique at the posterior third of the ventral margin. The most important characteristic is the presence of the **flat wavy radiating ribs with very narrow interstices** between them. *A. rathbuni* has no or few threads, coming close together towards the lateral margins. The middle of the disk has a glossier appearance because it lacks most radiating threads.



Acesta niasensis (Thiele, 1918)

Pl. 3, fig.3 from Thiele, J., 1918-20. Familia Limidae. In: H.C. Küster, W. Kobelt and H.C. Weinkauff, eds. *Systematisches Conchylien-Cabinet von Martini und Chemnitz* **7**(2a).



***Acesta* (*Callolima*) *niasensis* (Thiele, 1918)**
Kai Islands, Indonesia. 08°42’ S/ 131°53’ E.
H. 146.9 mm L. 110.0 mm. CFN.

***Acesta* (*Callolima*) *niasensis* (Thiele, 1918)**
Kai Islands, Indonesia. 08°42’ S/ 131°53’ E.
H. 146.9 mm L. 110.0 mm. CFN.

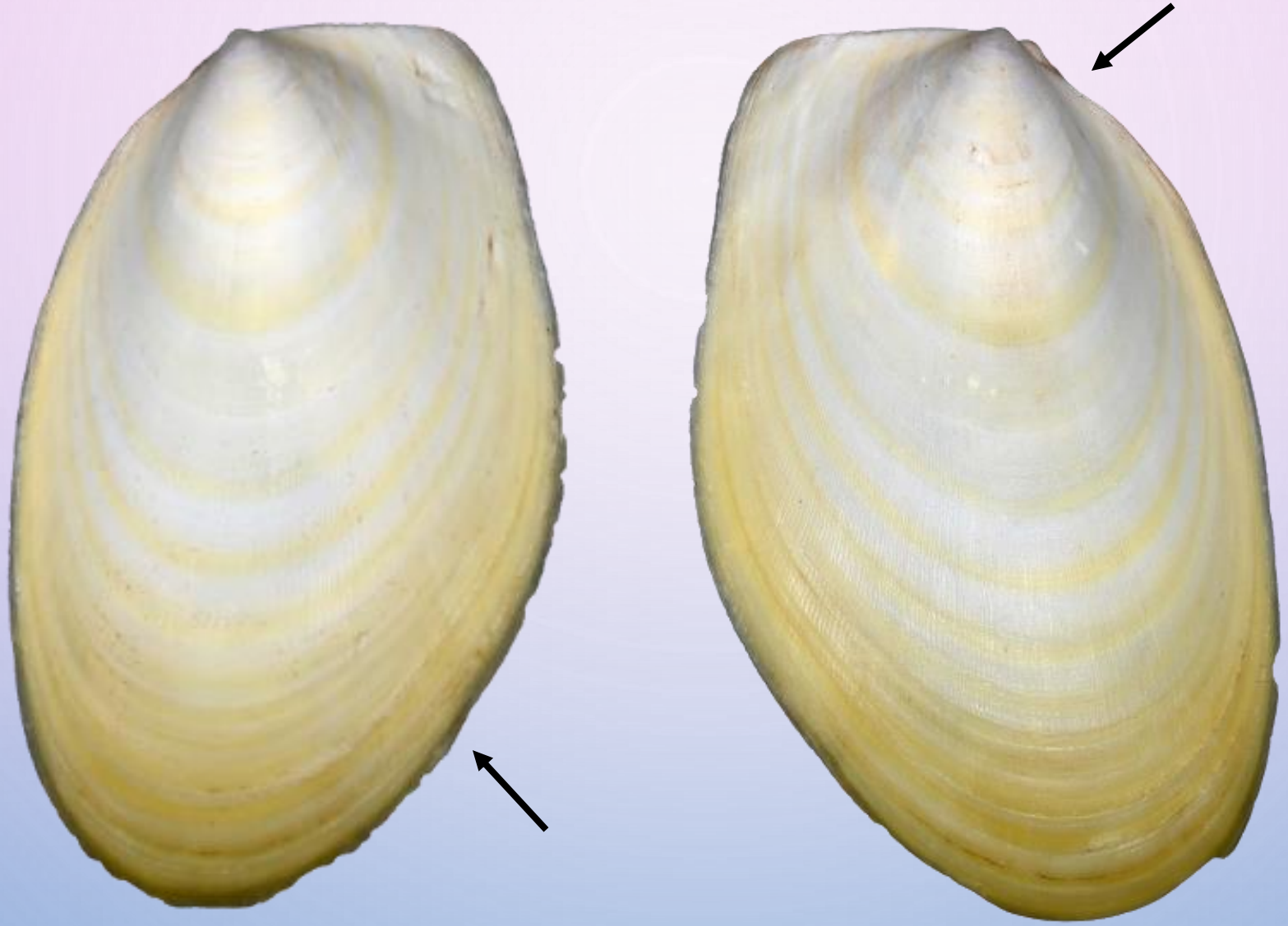
Acesta philippinensis (P. Bartsch, 1913)

Type locality: Tayabas Light, Philippines.

Most important characteristics:

- Shell **very large**, reaching **about 200 mm** with a maximum size of 260 mm.
- **Spatulate outline**, **slender**, **elongate and very obliquely shaped**, **truncated posteriorly** from the middle to the ventral margin.
- **Shell thin** and **very fragile**, slightly gaping at the lunule and narrowly so for the entire length of the posterior lateral margin.
- Outer surface marked with well-incised, fine, **quite regularly spaced wavy radiating riblets**. The incised lines are somewhat stronger at the lunule than elsewhere.
- Yellowish with concentric bands of darker lemon yellow, probably marking growth stages.
- Interior pale yellow with a deeper yellow coloured blotch in het middle of the valves.

***Acesta* (*Callolima*) *philippinensis* (Bartsch, 1913)**
Philippines. 12°20’ N/ 121°42’ E. Trawled at a depth of 674 m.
H. 179.5 mm L. 124.1 m. CFN.



***Acesta* (*Callolima*) *philippinensis* (Bartsch, 1913)** Philippines.
12°20’ N/ 121°42’ E. Trawled at a depth of 674 m.
H. 194.3 mm L. 120.5 mm. CFN.

Acesta rathbuni (P. Bartsch, 1913)

(syn. '*Lima crocea* Pelseneer, 1911'; '*Lima dalli*' Bartsch fide Huber, 2015)

Type locality: off the outer Tayabas Light, Philippines.

Most important characteristics:

- Shell large to **very large**, up to 243 mm.
- Outline **irregularly oval**. Slightly notched at dorsal part of the posterior margin.
- **Lunule** concavely, obliquely sloping. The remaining outline curving in a **regular oval**.
- Outer surface marked with irregularly **fine radiating threads**, faintly impressed, stronger on the lunule and **practically absent in the middle zone of the disk**, where the interstices become wider.
- Colour **light yellow**, but **white** specimens are not rare. Interior greyish white with often a yellow patch in the middle.

Remarks:

A. rathbuni is the **most widespread** and **most common** *Acesta* species in the **W Pacific**.

It **differs** from ***Acesta niasensis*** by its **more fragile** shell, except for old and large specimens (especially from NW Australia), and the slightly oblique outline in the lower half of the shell.
Radiating ribs are **straight** and **limited to fine threads** in the lateral parts of the disc, creating a **glossier appearance**.
Hinge very variable, from narrow and elongate to very broad.

A. niasensis possesses distinct **wavy radiating ribs over the whole surface** of the valves.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**
Off South Vietnam. South China Sea. Dredged at a depth of 400 m.
26 September 1984.
H. 188.5 mm L. 143.1 mm. CFN.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**
Siasi, Sulu Sea, Philippines. Trawled by fishermen.
H. 151.2 mm L. 117.3 mm. CFN.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**

Papua New Guinea. 06°06’ S/ 149°17’ E. MADEEP 2014 Expedition.
CP4338. Dredged at -510 m. In mud. H. 187.2 mm L. 138.2 mm. MNHN.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**

Off New Britain, Papua New Guinea. 06°07’ S/ 149°10’ E. MADEEP Expedition. CP4334. Trawled at -400 m. 6 May 2004. H. 243.4 mm L. 183.2 mm. MNHN.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**

Off New Britain, Papua New Guinea. 06°07’ S/ 149°10’ E. MADEEP Expedition. CP4334. Trawled at -400 m. 6 May 2004. H. 243.4 mm L. 183.2 mm. MNHN.

***Acesta* (*Callolima*) *rathbuni* (Bartsch, 1913)**

Off Broome, Western Australia. Trawled on sand and mud at a depth of 450-500 m.
H. 219.3 mm L. 177.6 mm. CSH.

Subgenus *Plicacesta*

In the subgenus ***Plicacesta***, species have a lunule which is very straight sloping towards the middle of the anterior margin and possess a large number of **evident ribs which become stronger from the lateral margins towards the middle of the disc**.
Margins are strongly crenulated.

Acesta (*Plicacesta*) *lemuriensis* Nolf & Hubrecht, 2022

Type locality: Off the Seychelles, Indian Ocean. 10°57’ S/ 60°16’ E.

Most important characteristics:

- Shell moderately large, **obliquely ovate**, inequilateral, opisthocline, slightly inflated, white.
- **Dorsal margin short**.
- About **70 rounded radiating ribs**, moderately elevated, becoming stronger from the lateral margins to the middle of the disc and spaced by **equally broad interstices**.
- **Ribs** extending beyond the margins, creating **sharp scales**.
- **Grooves** between ribs are so **deeply incised** that they can be observed and felt from the inside of the valves.
- **Growth stages clearly visible**, creating a roof tile appearance.
- **Anterior auricles** extremely small, the **posterior** relatively larger, sloping slightly downwards and thickened.
- **Lunule** with 3-4 ribs, rather narrow but very large, and **sloping down in a straight line** to about the middle of the anterior margin.

Remarks:

The new *Acesta* species can only be **compared** with ***Acesta smithi***, both being representatives of the subgenus ***Plicacesta***.

The **Japanese species** has a smaller and more sloping down posterior auricle and **only two thirds of the total number of radiating ribs** present in the Lemurian species.

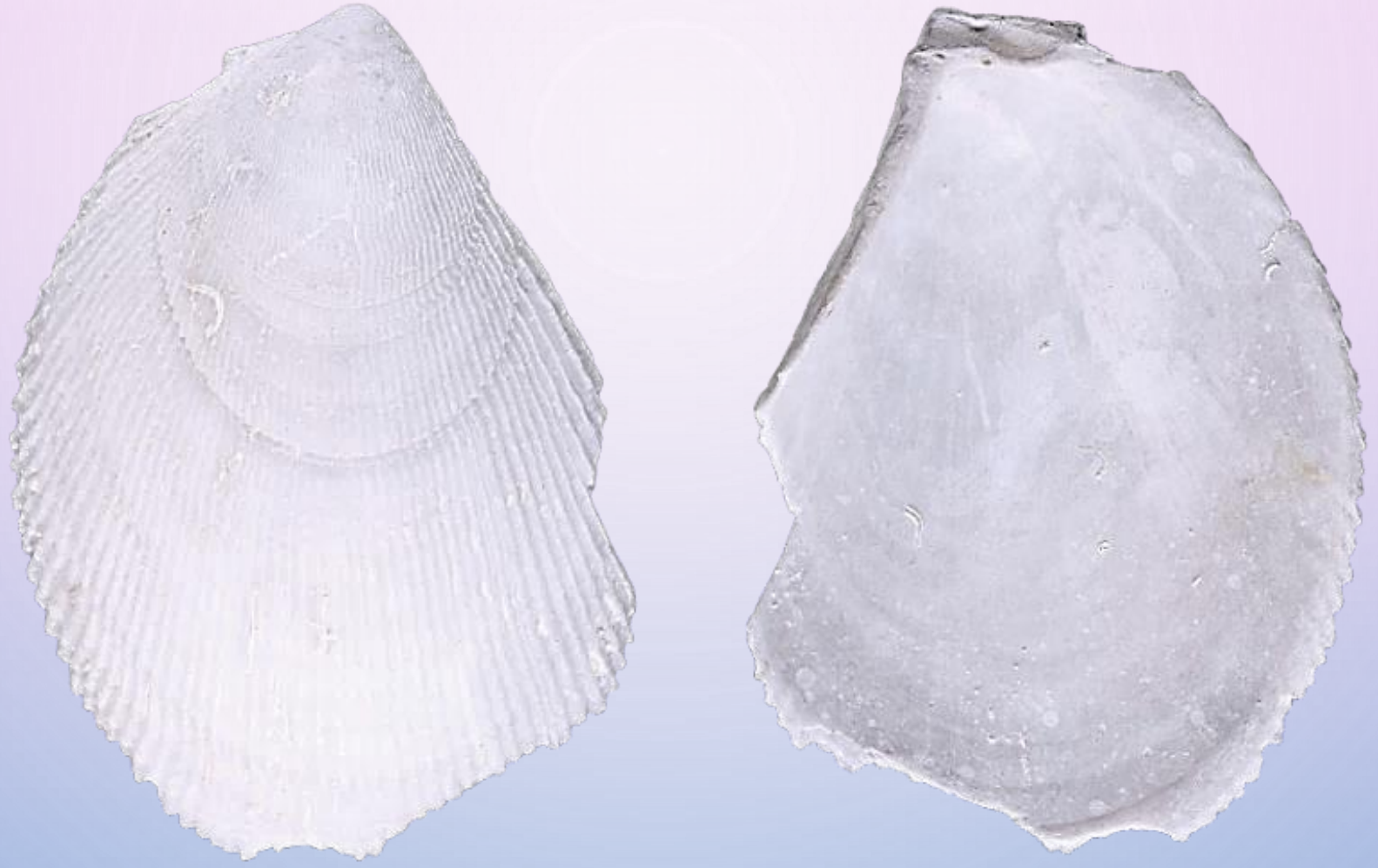
Acesta indica has a convex smaller lunule, a straight horizontal posterior auricle and a **larger number of radiating ribs**, present as **fine threads instead of strong ribs** with scaly margins as in *A. lemuriensis*.

***Acesta* (*Plicacesta*) *lemuriensis* Nolf & Hubrecht, 2022**

Off Seychelles, Indian Ocean. 10°57’ S/ 60°16’ E. N.O. “Marion Dufresne”.
SOMIRMAS Expedition. Stn DR50. Trawled between 286-500 m. 1990.
H. 125.61 mm L. 95.63 mm. Holotype MNHN

***Acesta* (*Plicacesta*) *lemuriensis* Nolf & Hubrecht, 2022**

Off Seychelles, Indian Ocean. 10°57’ S/ 60°16’ E. N.O. “Marion Dufresne”.
SOMIRMAS Expedition. Stn DR50. Trawled between 286-500 m. 1990.
H. 92.05 mm L. 62.94 mm. Paratype 1. MNHN.



***Acesta* (*Plicacesta*) *lemuriensis* Nolf & Hubrecht, 2022**

Off Seychelles, Indian Ocean. 10°57’ S/ 60°16’ E. N.O. “Marion Dufresne”.
SOMIRMAS Expedition. Stn DR50. Trawled between 286-500 m. 1990

H. 94.87 mm L. 71.20 mm. Paratype 2. MNHN.

Acesta (*Plicacesta*) *smithi* (G.B. Sowerby III, 1888)

Type locality: Japan.

Most important characteristics:

- Shell **obliquely ovate**, opisthocline, slightly inflated and relatively thin.
- **Dorsal margin short**.
- **Posterior auricle** less sloping down compared to ***A. lemuriensis***.
- About **40** rounded **radiating ribs** moderately elevated, slightly waved.
- Anterior auricles small, the posterior relatively large.
- Colour yellowish white.

***Acesta* (*Plicacesta*) *smithi* (G.B. Sowerby III, 1883)**
Off Katsuyama, Uraga Strait, Chiba Prefecture, Japan.
Taken by nets at a depth of 250 m. November 2003.
H. 96.1 mm L. 68.9 m. CSH.

Acesta* (*Plicacesta*) *smithi
(G.B. Sowerby III, 1883)
Off Chikura Strait Pacific Side, Chiba Pref., Japan.
Trawled between 400-800 m.
H. 78.6 mm L. 57.8 mm. CSH.

Acesta* (*Plicacesta*) *smithi
(G.B. Sowerby III, 1883)
Northern Sagami Bay, Japan.
Trawled by gill nets between 300-350 m.
24 March 1996.
H. 79.5 mm L. 63.9 mm. CSH.

Acesta virgo Habe & Okutani, 1968

Type locality: Midway Island, Hawaii.

Remark: Poppe (2010) figured a very similar specimen, identified as *Acesta* cf. *virgo* from Bodo, Siquijor, Philippines.

Typical is the **nearly circular outline**, the **very short hinge plate** and the small posterior auricle compared to Philippine specimens of *Acesta rathbuni*.

Acesta vitrina Poppe, Tagaro & Stahlschmidt, 2015

Type locality: Central Point, Punta Engaño, Mactan Island, Philippines.

Remarks: The **thin**, **translucent shell** in combination with the unusual **very oblique** outline is beyond any comparison with a typical *Acesta*. Moreover, this is most likely a **juvenile stage of another species**, belonging to **another genus**.
Only known from the **holotype** and **one paratype**.

Poppe et al. placed this species in the genus *Acesta* '*with reluctance*', an opinion which we completely share.

Conclusion:

A **revision** of the **genus *Acesta*** is **not so straightforward** because specimens live in **deeper water** (300-1500 m) and are mostly only available from **scientific expeditions**.

Fortunately, the material of the **MNHN** was often live collected, still containing the animals, but as could be suspected many specimens were broken or restricted to single valves only. Nevertheless, the specimens looked even in **better condition** than those used by **previous authors** to describe new species. Many authors in the past were limited in their availability of good quality material.

Problems caused by several authors:

- Species described based on **minor variations** of available specimens (e.g., Bartsch, 1913).
- **Misleading pictures**, even on a **fragment** or a **juvenile** specimen (e.g., Bartsch, 1913).
- The use of **few accurate drawings** (Thiele, 1932).
- **Very short descriptions** (several authors).
- The creation of new names **without description** or **adequate images** (Stuardo, 1968)

… in contrast with the accurate opinions of H.E. Vokes (1963a & b) and M. Huber (2015) when they evaluated the status of most *Acesta* species.

More remarks:

- The condition of the **hinge plate** and the **resilifer/resilium** are **not** of primordial importance
- In reality, this is a **very variable characteristic** depending on heredity, habitat and certainly on the age of the specimens. Gerontic specimens have a very broad hinge and a deeply excavated resilifer. The **hinge figures by Thiele** (1932) are **not useful as identification tool**.
- Our mapping is based on several parameters e.g., the outline, the hinge, the thickness of shells, and most of all the radial ribbing of the valves.

- The **most difficult 'group'** contains the species which belong to the subgenus ***Callolima***, namely *A. bartschi*, *A. kronenbergi*, *A. marissinica, A. niasensis*, *A. philippinensis* and *A. rathbuni*.

- Specimens which possess extremely distinctive characteristics can easily be identified, but often many specimens are intermediate between extreme forms.

- Species names like ***Lima bartschi*** Thiele, 1918 and ***A. kronenbergi*** should be considered **junior synonyms** and after molecular analysis possibly more dubious species names should be degraded later on.

- ***Acesta butonensis*** is most probably a juvenile form of ***A. verdensis.***

- A **new species** is described from the Seychelles area: ***Acesta* (*Plicacesta*) *lemuriensis* Nolf & Hubrecht, 2022**.

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