

PLICATULOSTREA, A NEW GENUS OF PLICATULIDAE (BIVALVIA: PECTINOIDEA) FROM THAILAND

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ABSTRACT. – *Plicatulostrea onca*, a new genus and species of Plicatulidae, is described based on shell and anatomy. The samples were collected under intertidal rocks at Kungkrabaen Bay, Thailand. *Plicatulostrea* differs from other plicatulids mainly in lacking undulations or shell sculpture, by long projections of the hinge teeth of the right valve and extreme body compression. *Plicatulostrea onca* has a radially arranged spots at the shell surface and typical plicatulid anatomy, differing mainly by the richness of papillae on the mantle edge and by invasion of the gonad along the mantle lobes. Some comments on the anatomy of the family are also provided.

KEYWORDS. – *Plicatulostrea onca*, anatomy, morphology.

INTRODUCTION

During the field activities of the International Marine Bivalve Workshop in Chantaburi, Thailand, an interesting sessile bivalve was collected living under intertidal rocks. Analysis of the sample revealed a new genus and species of Plicatulidae.

The plicatulids are sessile bivalves that permanently attach one valve of their shells to hard substrata, normally rocks, corals, or shells of other molluscs. Their oyster-like mode of life is one of the more important features of the family as is the presence of strong undulations close to the shell borders. The latter feature is the source of the common name “kitten’s paw” for these animals. The most obvious feature for differentiating plicatulids from ostreids is a well-developed, chevron-like hinge with an internal ligament.

Shell undulation is present in all genera known to date. The new genus described here is the first with representatives with a planar, smooth shell. The genera included in Plicatulidae are *Plicatula* Lamarck, 1801 (type species *Spondylus plicatus* Linnaeus, 1758, subsequent designation by Schmidt, 1818); *Atreta* Etallon in Thurmann & Etallon, 1862 (type species *Ostrea blandina* d’Orbigny, 1850, subsequent designation by Cox, 1964), and *Saintiopsis* Sacco, 1898 (type species *Plicatula laevis* Sacco, 1898, original designation). Only *Plicatula* has representatives in the Recent, whereas the other two genera are fossil; *Atreta* occurs from the Triassic to the Cretaceous (North America and Europe), whereas *Saintiopsis* occurs in the Pliocene of Italy (Cox & Hertlein, 1969).

Anatomical information about plicatulids is very scanty and restricted to a few species (Watson, 1930). The objective of this work is not only to provide more complete information of the species, but also to suggest further arguments about its taxonomic allocation and for future comparisons.

MATERIALS AND METHODS

Specimens were collected and fixed directly in 70% ethanol. Dissections were performed with the specimen immersed in fixative under a stereomicroscope. All drawings were made with the aid of a camera lucida. Comparative dissection was performed on *Plicatula gibbosa* Lamarck, 1801, from the Florida Keys, Florida, USA (American Museum of Natural History, New York, AMNH 298913). Type specimens are deposited at the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZSP), and the Field Museum of Natural History, Chicago, Illinois, USA (FMNH).

SYSTEMATICS

Plicatulostrea, new genus

Diagnosis. – Shell with right valve molded to substratum, with outer surface attached to hard substratum. Left valve free, planar, lacking sculpture or undulations. Configuration greatly compressed laterally, widely splayed in other directions, typically forming a circle. Hinge composed of three teeth situated divergently, each possessing ligamental

surface with its socket of opposing valve. Single (posterior) adductor muscle, located closer to ventral region. Foot totally absent in adult. Palps with reduced dendritic projections. Gonad partially located in dorsal region of mantle lobes. Nephropores located close to adductor muscle.

Included taxa. – *Plicatulostrea onca* new species (possibly *Plicatula anomioides* Keen, 1958; see discussion).

Etymology. – The epithet is a combination of the generic names *Plicatula* and *Ostrea* Linnaeus, 1758, an allusion to the oyster-like aspect of the animal. Gender is feminine.

Plicatulostrea onca, new species
(Figs. 1–29)

Material examined. – Type material: Holotype (MZSP 82371). Paratypes: 2 ex. (MZSP 55266), sta. KKB-07, Thailand, Chantaburi (Gulf of Thailand), Kungkrabaen Bay, Laem Ban Kungkrabaen, ocean-side peninsula at southern inlet to Kungkrabaen Bay, 12°34.932'N 101°53.147'E, rocky shore, coll. Simone, Aug.2005; 1 valve (FMNH 310451), sta. KKB-07 (same as previous); 2 ex. (MZSP 54993), sta. KKB-05, Thailand, Chantaburi (Gulf of Thailand), Kungkrabaen Bay, Laem Ban Kungkrabaen, oceanside peninsula at northern inlet to Kungkrabaen Bay, 12°35.22'N 101°53.05'E, shoreline rocks, coll. Simone, Aug.2005.

Other Material. – None.

Diagnosis. – Flattened, rounded shell coloured by minute spots somewhat radially disposed.

Description. – Shell (Figs. 1–9): Size to 40 mm. Sessile, with shell molded to substratum, highly compressed laterally; widely splayed ventrodorsally and anteroposteriorly. Colour white with dark to pale brown spots arranged somewhat radially (Figs. 6, 8); spots more concentrated and coalescent in some specimens (Fig. 1); umbonal region lacking spots (Figs. 1, 6). Outer surface opaque, lacking sculpture or undulations; growth lines and commarginal, irregular scales apparent in some specimens (Figs. 6, 8), possibly due to previous injuries. Outline typically rounded, dorsoventral distance from slightly to clearly longer than anteroposterior length. Umbo low, broadly pointed. Inner surface white, glossy; spots of outer surface seen by transparency (Fig. 9), mainly at edges (Figs. 3, 7, 9). Hinge located away from shell edge, between anterior and dorsal quadrant; length ca. one quarter of anteroposterior shell length; height ca. one seventh of dorsoventral shell height. Hinge totally symmetrical from frontal virtual plane. Left valve with four teeth disposed convergently towards umbo (Figs. 3–5, 9); anterior and posterior lateral teeth (Figs. 22–28; hl) wide (each ca. one fifth of hinge length), somewhat rectangular, with ligament lying along tip (ll); tips of lateral teeth elongated and pointed, extending beyond valve edges, penetrating in right valve socket beyond umbo of left valve (Figs. 25–28); both lateral teeth disposed as chevrons; with two sockets between anterior-posterior teeth and central teeth, each equivalent to each tooth width (Figs. 24, 28). Central teeth of left valve (Figs. 22–24, 28; hc) associated with resilium, with total

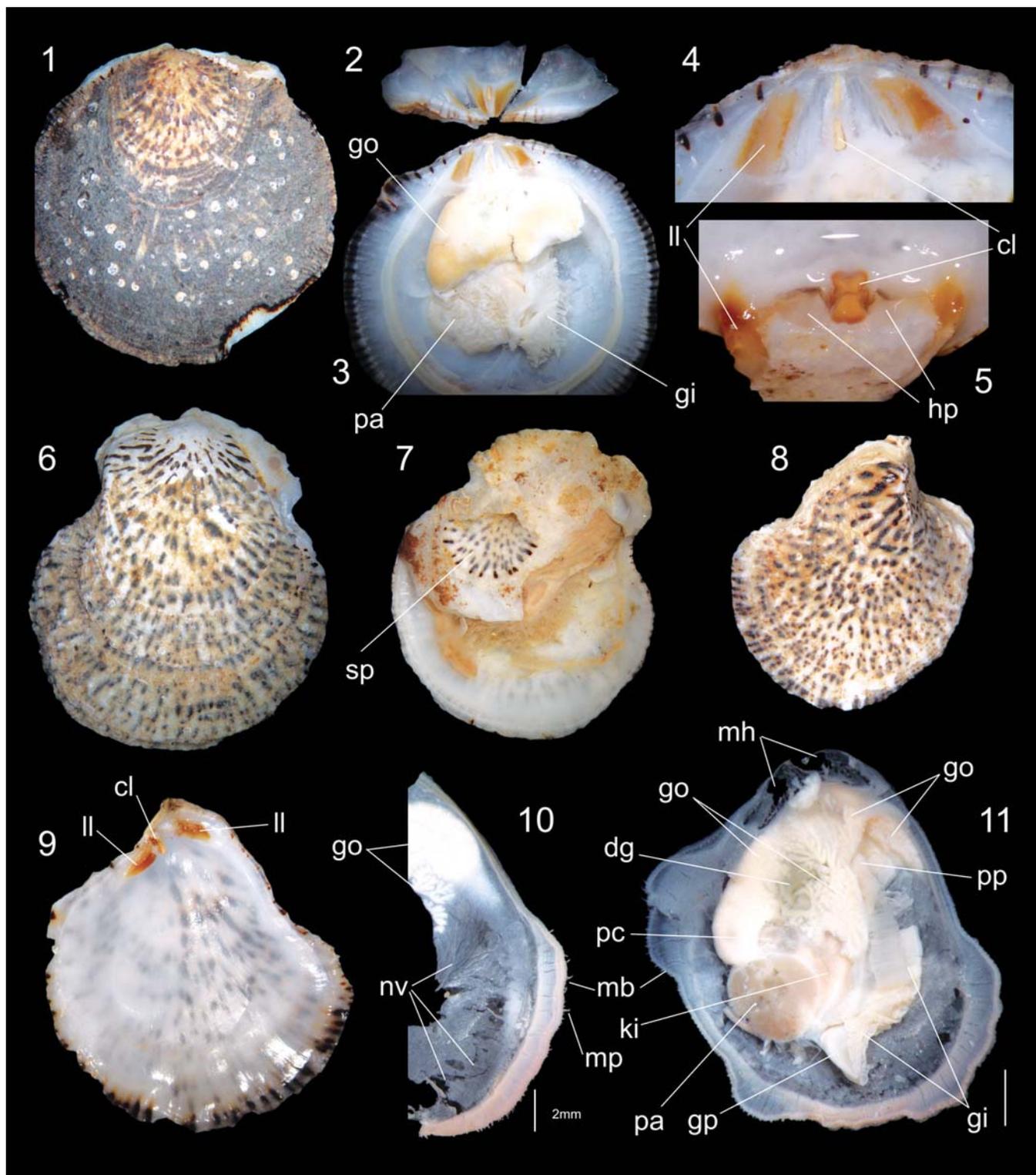
width similar to that of each lateral tooth; each central tooth of ca. one quarter lateral tooth width. Resilium extending longitudinally along central furrow between central teeth; resilium triangular, much wider ventrally (Figs 22–23; cl). Right valve with four teeth (Figs. 2, 5); pair of secondary teeth small and low (Figs. 28–29; hs), located ventrally and externally to lateral teeth of left valve, of size ca. one twentieth of lateral teeth. Anterior and posterior main teeth narrow (ca. one tenth of hinge length), weakly curved (Figs 24, 28–29; hr), with ligament lying along their tips (Fig. 29; ll); each main tooth ca. half size of lateral tooth of left valve, including a somewhat long projection towards dorsal and to umbo (Fig. 28; hr); apical edge wider than basal region (Figs. 24, 29); narrow central elevation as base of resilium; with socket of left valve central teeth between this elevation and main teeth; between both main teeth an area equivalent to central teeth of left valve, including internal ligament. Muscle scar occupying ca. one tenth of valve surface, rounded, located on inner region of posterodorsal quadrant (Figs. 2, 9).

Main muscle system (Figs. 3, 11–12): Anterior adductor muscle absent. Posterior adductor muscle large, occupying ca. one tenth of valve area, located slightly ventral and posteriorly of valve center; possessing two components, anterior of which ca. 40% of muscle volume. Pedal muscles absent.

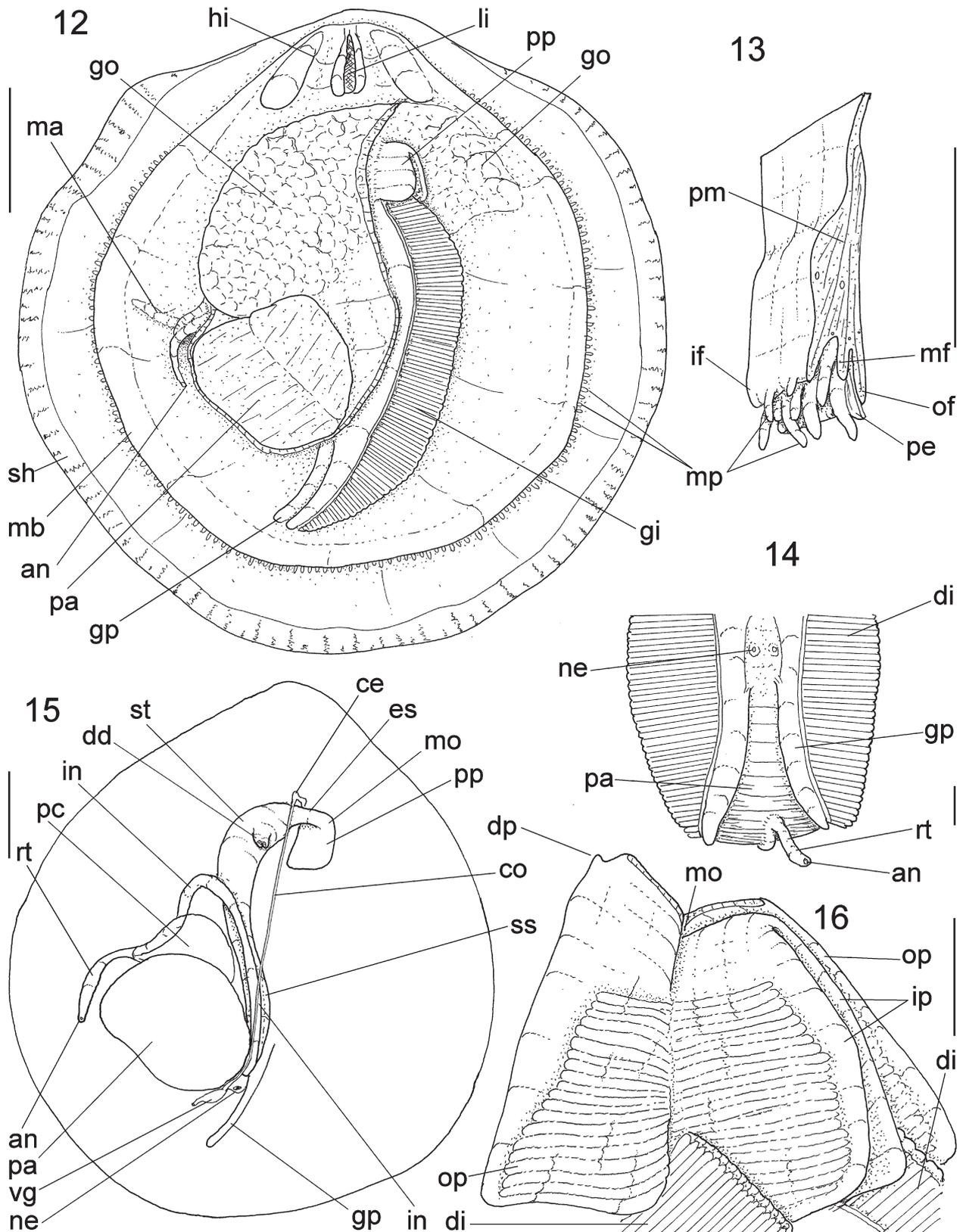
Foot and byssus: Both absent.

Mantle (Figs 3, 10–13): Mantle lobes pinkish, translucent except in region close to border and preceding visceral mass, not fused between lobes, except close to hinge. Mantle border thicker from pallial line to edge, a distance equivalent to one twelfth of valve height. Mantle edge trifolded (Fig. 13), with folds of similar height (ca. one thirtieth of valve height). Outer fold smooth and simple, equivalent in thickness to mantle area preceding pallial line. Periostacum attached to inner surface of outer fold. Middle fold with a series of papillae along distal edge (Figs. 10–13); each papilla cylindrical, with rounded tip; disposed in general arrangement of longer papilla intercalating with shorter papilla (those longer of approximate height of fold, and those shorter ca. half of the latter); papillae located close to one another, at a distance equivalent to half of their width. Inner fold with series of short papillae on distal edge (Fig. 13), each papilla similar to those of middle fold, except in being ca. one third of fold height and separated from each other by distance ca. three times their width. Gonad extending beyond visceral mass in anterior region, to a distance equivalent to area of visceral mass, inside mantle lobe of both sides [Fig. 10–12; go (left)]. Transverse fold low, relatively narrow, separating supra- and infra-anal regions, extending from anal base to region preceding mantle border, narrowing and fading gradually (Fig. 12; ma). Detectable radial nerves extending from mantle edge, coalescing in direction of adductor muscle (Fig. 10; nv).

Pallial cavity (Figs. 3, 11–12): Occupying ca. two thirds of inner shell volume; surrounding almost entire adductor



Figs. 1–11. *Plicatulostrea onca* shells and anatomy: 1, Holotype (MZSP 82371), LV, exterior view; 2, same as 1, detail of hinge of RV; 3, same as 1, right view, LV, and part of left mantle lobe removed, total length 30.0 mm; 4, same as 1, detail of hinge of LV; 5, paratype (MZSP 54993), detail of hinge with intact ligaments, interior ventral view; 6, same as 5, intact left view; 7, same as 5, intact right view (note a covered smaller and dead specimen; sp), total length 35.6 mm; 8, paratype (MZSP 54993), intact left view; 9, same as 8, LV, interior view, total length 32.0 mm; 10, same as 8, part of right mantle lobe, interior view; 11, same as 8, intact right view, valves and part of right mantle lobe removed. cl, central portion of ligament; dg, digestive diverticula; gi, gill; gp, gill suspensory stalk; hp, high projections of hinge of right valve; ki, kidney tissue; ll, lateral portion of ligament; mb, mantle border; mh, mantle portion that forms hinge; mo, mouth; mp, mantle papillae; nv, nerve; pa, posterior adductor muscle; pc, pericardium; pp, palp; sp, specimen covered by other (larger) specimen. Scale bars = 2 mm.



Figs. 12–16. *Plicatulostrea onca* anatomy: 12, Intact right view, RV and part of right mantle lobe removed; 13, mantle border, detail of mid region of ventral side of right mantle lobe; 14, region of adductor muscle, ventral view, both gills deflected; 15, topology of digestive system, right view, with some adjacent structures also shown; 16, palps, right view, right exterior hemipalp deflected after sectioned from its pair along median line, short portion of interior demibranch (di) also shown. an, anus; ce, cerebral ganglion; co, cervicovisceral connective; dd, ducts to digestive diverticula; di, inner demibranch; dp, dendritic projection of palp; es, oesophagus; gi, gill; go, gonad; gp, gill suspensory stalk; hi, hinge; in, intestine; ip, inner hemipalp; li, ligament; ma, mantle fold; mb, mantle border; mf, middle fold of mantle border; mo, mouth; mp, mantle papillae; ne, nephropore; of, outer fold of mantle border; op, outer hemipalp; pa, posterior adductor muscle; pc, pericardium; pe, periostacum; pm, pallial muscles; pp, palp; rt, rectum; sh, shell; ss, style sac; st, stomach; vg, visceral ganglia. Scale bars: 10, 13 = 5 mm; remaining = 1 mm.

muscle except in anteroventral quadrant. Infra-anal region wider. Supra-anal region narrow, surrounding entire visceral sac; ca. one sixth of infra-anal region; region close to hinge very narrow (Figs 3, 12). Palps located at anterior end of cavity; length ca. one seventh of valve length, height ca. 70% of length; both hemipalps somewhat similar to each other; lips surrounding mouth relatively long (Fig. 12); palp outer surface smooth, velvet-like; palp inner surface with ca. 20 transverse folds restricted to posterior three quarters of hemipalp length (Fig. 16); each fold perpendicular to anteroposterior axis, intersection between hemipalps a smooth furrow, distal end of each fold rounded, at some distance from palp edge, this distance becoming wider towards anterior; region close to mouth smooth. A very small, median projection in intersection between outer hemipalps, at edge, interpreted as vestigial dendritic projection (Fig. 16; dp). Gill inserting ca. one quarter of palp length, along posterior intersection between hemipalps (Fig. 16; di). Gill filibranch of ca. three quarters of valve length, width ca. one fifth of valve width. Gill profile as described by Watson (1930: fig. 3), except for region between demibranchs slightly narrower; ventral edge between lamellae of each demibranch possessing thicker, hardened area, strongly connected to same region of neighbouring filaments by cilia. Pair of posterior gill stalks stubby, supporting ca. one quarter of gill length; originating at mid ventral side of adductor muscle, narrowing gradually; tips relatively rounded; distance between gill stalks equivalent to one fifth of adductor muscle width (Figs. 11–12; gp).

Visceral mass (Figs. 3, 11–12): Occupying ca. one sixth of total body volume; located from ventral region of hinge to anterior surface of adductor muscle. Digestive diverticula white, located in anterior region just dorsal to palps; occupying ca. one quarter of visceral mass. Gonad pale beige, occupying ca. half of visceral mass dorsal and mid regions; thin portion externally covering digestive diverticula; extending also, as described above, through short portion of anterior region of mantle lobes. Reno-pericardial structures occupying ca. one quarter of visceral mass, located in posterior region, surrounding anteroventral quadrant of adductor muscle. Digestive tubes mostly concentrated in ventral region (more details below).

Circulatory and excretory systems (Figs. 18, 19): Pericardium occupying most of reno-pericardial volume. Pair of auricles very thin walled; narrow portion originating from mid region of ctenidial vein, extending perpendicularly from gill (Fig. 18; cv); a short distance later (ca. one sixth of total auricle length) gradually expanding and approaching anterior surface of adductor muscle; three quarters of auricles widely connected to surface of pericardium attached to adductor muscle, occupying nearly that entire surface. Auricles each divided into two portions; one portion basal, attached to pericardium, triangular, cone-like, with lobed anterior portion (Fig. 18; au); other portion connecting basal portion with ventricle, somewhat cylindrical, of ca. half of basal portion volume, attached to basal portion narrowly in mid region of its dorsal surface (Fig. 18; ax). Ventricle surrounding entire intestine as it passes through pericardium; connection with auricle in anterior third, weakly dislocated ventrally. Kidney

located in ventral surface of reno-pericardial area, surrounding ventral surface of adductor muscle, mostly hollow; renal tissue scanty, restricted to anterior region (Fig. 19; ki); renal chamber narrowing gradually towards anterior as two pairs of hollow chambers. Nephropore terminal, at anterior end of these chambers; each at tip of low, muscular papilla, located in median region of gill stalk base (Figs. 14–15, 19; ne), in posterior extremity of suprabranchial chamber.

Digestive system (Fig. 15): Palps as described above (Fig. 16). Mouth wide, located deep inside intersection of palps (Fig. 16; mo). Oesophagus short (ca. one twentieth of shell length) wide, weakly dorsoventrally flattened; inner surface with ca. eight longitudinal folds, close to one another, each fold relatively wide, low. Transverse fold separating oesophageal from gastric portions; relatively tall and wide (ca. one quarter of oesophageal width) (Fig. 17; tr). Stomach extending almost entire visceral mass length; main chamber occupying anterior half, style sac occupying posterior half. Pair of ducts to digestive diverticula located in anterior third of main stomach chamber, lateroventrally; each duct shortly dichotomous. Stomach inner surface (Fig. 17) mostly smooth, lacking clear sorting areas; gastric shield occupying ca. one quarter of main gastric chamber surface, located on posterior left side; longitudinal fold of ca. one fifteenth of stomach width, extending at some distance from gastric shield, along right side; its anterior end connected to another longitudinal fold, of similar character, extending on opposed side, part of it edging gastric shield left border; transverse fold separating main gastric chamber from style sac, connected almost perpendicularly to longitudinal folds, of character similar to longitudinal folds, but ca. half as wide; both ducts to digestive diverticula without special structures. Style sac with pair of narrow, longitudinal folds on right side (Fig. 17; ss); each fold of ca. one fifteenth of style sac width, placed close to each other, distance between them equivalent to two times fold width; dorsal fold continuing along main gastric chamber, extending inside posterior surface of right duct to digestive diverticula; ventral fold connected to longitudinal gastric fold and transverse fold separating gastric chamber from style sac. Style sac narrowing gradually, reaching posteroventral end of visceral sac, on ventral surface of adductor muscle. Intestine separated from style sac terminally, marked by sudden twist towards anterior; extending along right side of style sac; performing wide loop in posterior region of gastric main chamber, extending dorsally and posteriorly; after this forming sinuous loop, passing through pericardium (Fig. 15; in); estimated intestine length equivalent to one and one half times visceral mass anteroposterior length. Rectum as stalk to anus, attached to adductor muscle only at base, reinforced by pair of dorsoventral folds (Figs. 12, 18; rt); length ca. half of that of adductor muscle, gradually narrowing. Anus terminal, simple, narrow.

Genital system: Gonad as described above (Figs. 3, 10–11; go), occupying most of visceral sac and also portion of anterior region of mantle lobes; some portions clearly branched (Fig. 11). Gonad acini converging in pair of small genital papillae, each located on dorsal wall of kidney, between middle and posterior thirds, weakly dislocated medially (Fig. 19; np).

Central nervous system (Figs. 15, 20–21): Pair of cerebral ganglia located close to oesophageal insertion at stomach; estimated volume of each ganglion equivalent to one quarter of transverse section of oesophagus. Each cerebral ganglion ovoid (Fig. 20), with taller region facing medially. Cerebral commissure relatively short (ca. same length as each ganglion). Pair of cerebropleural connectives extending along entire visceral sac, close to its ventral wall. Pair of visceral ganglia (Fig. 21) ca. three times cerebral ganglia volume; located close to base of gill stalks, in posteroventral edge of adductor muscle. Visceral commissure very wide, almost as wide as ganglia. No pedal ganglia located.

Measurements. – Respectively, dorsoventral height, anteroposterior length, and maximum lateral inflation, all in mm. Holotype (MZSP 82371): 30.0 × 29.3 × 5.0; Paratypes: MZSP 54993(#1): 32.0 × 24.0 × 9.1 (Fig. 8); MZSP 54993(#2): 35.6 × 32.4 × 7.2 (Fig. 6).

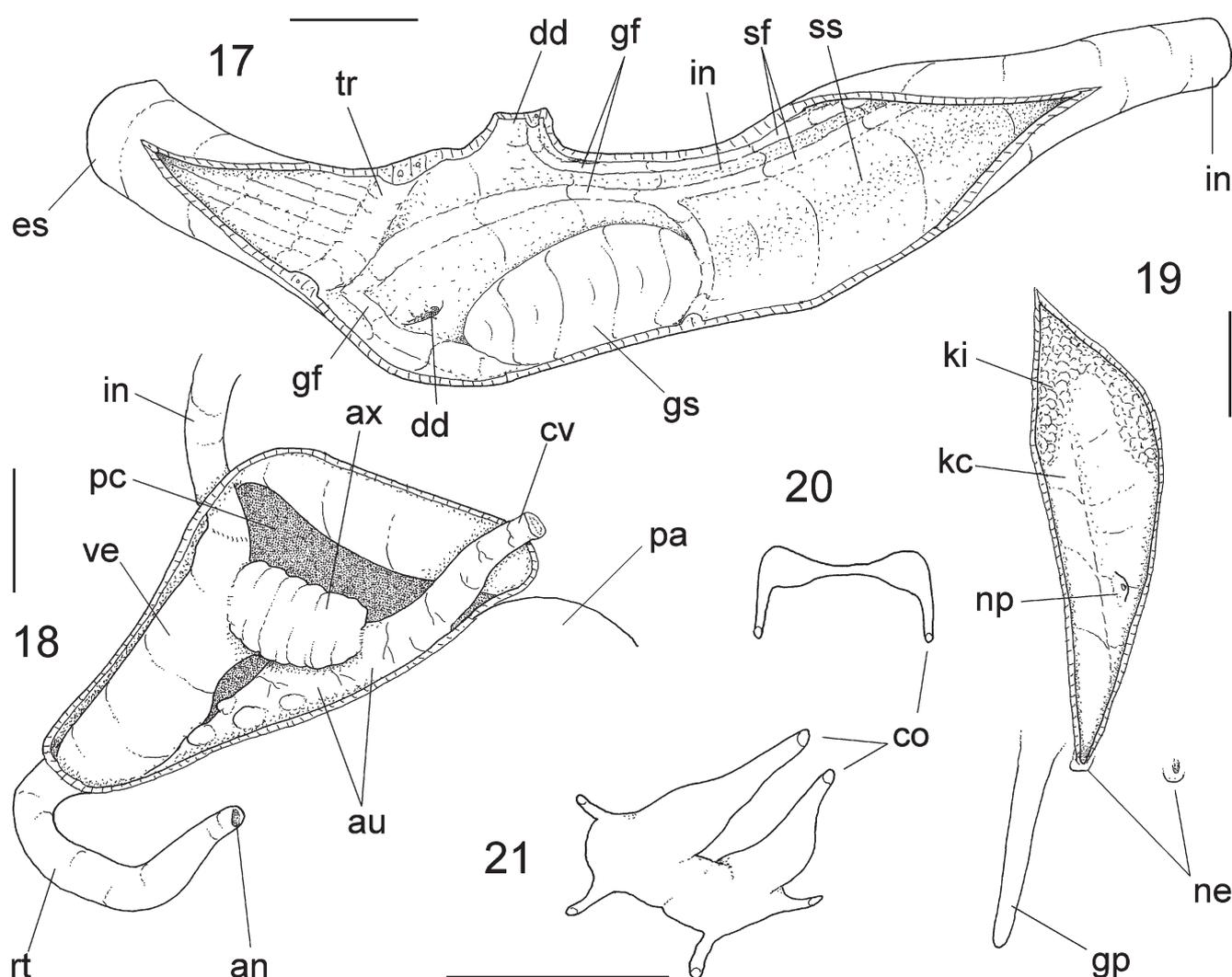
Distribution. – Only known from Thailand, Kungkrabaen Bay.

Habitat. – Under intertidal rocks. Collected in tide pools amongst cobbly beach and shoreline rocks.

Etymology. – The specific epithet is a noun referring to the dotted colour pattern on the shell, looking like a panther or jaguar, *Panthera onca* Linnaeus, 1758.

DISCUSSION

The different hinge and cementation of the right valve, so characteristic of the Plicatulidae, have been the subject of several papers (e.g., Hautmann, 2001; Hesselbo et al., 2003). *Plicatulostrea* has the same characters in these aspects as the remaining representatives of the family. On

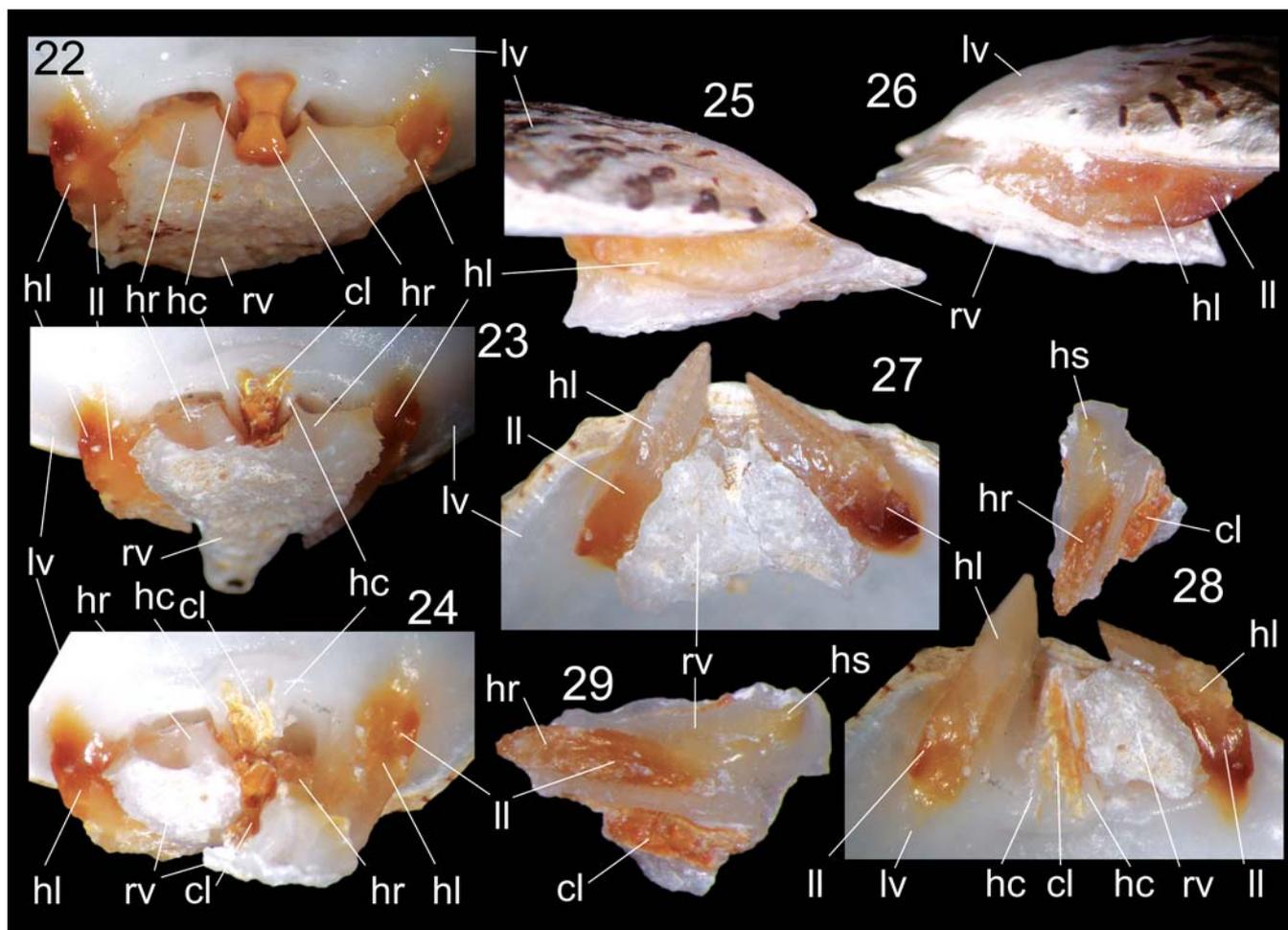


Figs. 17–21. *Plicatulostrea onca* anatomy: 17, Stomach and adjacent digestive system, right view, sectioned longitudinally to expose interior surface; 18, renopericardial region, right view, right wall of pericardium removed, with some adjacent structures also shown; 19, visceral mass, ventral view, right kidney chamber (kc) opened longitudinally and deflected, with some adjacent structures also shown; 20, cerebral ganglia, anterior view; 21, visceral ganglia, ventral and slightly right view (both pair of ganglia at same scale). an, anus; ax, auxiliary portion of auricle; co, cerebrovisceral connective; cv, ctenoidal vein; dd, ducts to digestive diverticula; es, oesophagus; gf, gastric fold; gp, gill suspensory stalk; gs, gastric shield; in, intestine; kc, kidney chamber; ki, kidney tissue; ne, nephropore; np, nephrostome; pa, posterior adductor muscle; pc, pericardium; rt, rectum; sf, fold separating intestine from style sac; ss, style sac; tr, transverse rim between oesophagus and stomach; ve, ventricle. Scale bars = 1 mm.

the other hand, anatomical aspects are very scant in the plicatulid literature. Some anatomical information about *Plicatula australis* Lamarck, 1819, was given by Watson (1930). Besides that paper, some anatomical information was obtained in dissections of *P. gibbosa* (see Materials and Methods). The different fashion of the *Plicatulostrea* shell lies mainly in the lack of sculpture or undulations, which are always present in other plicatulids. The Mesozoic *Atreta* is similar to *Plicatulostrea* in being flattened, however, *Plicatulostrea* lacks the well-developed radial striation and the thickened edge, lacks shell auricles and has much larger hinge teeth. The *Plicatulostrea* hinge is very similar to those of the other plicatulids and is the main shell character for the family. Characters and special nomenclature for each component of the hinge were given by Yonge (1973) and Waller (1978: 352–353).

The hinge of *Plicatulostrea onca* is one of the outstandingly different characters; the study of this region of the shell was done with special care, various steps of the shell dissection

are shown in Figs. 22–29. Despite the fact that no functional experiments were performed, some inferences based on morphology can be realised. The arrangement of the hinge teeth certainly greatly limits the valve aperture. All main teeth have a free edge wider than its base (Figs. 24, 28); this conformation is followed by the respective sockets in the opposing valve, rendering wide movement virtually impossible. Besides this, the main teeth of the hinge, the lateral teeth of the left valve, possess a long projection, extending beyond the valve edge (Figs. 25–27); these projections are encased in deep respective sockets that reach the umbo of the right valve. The arrangement of the major teeth, mainly the lateral teeth of the left valve, is oblique and turned dorsally. All of these structures must be broken for ampler valve abduction. The adjacent shell regions of each hinge tooth must be broken and removed (Figs. 22–29) for a study of these teeth. Another factor that precludes the valve aperture is the distance of the hinge from shell edge and its total chevron shape. The restriction of the valve aperture could be important against predation.



Figs. 22–29. *Plicatulostrea onca*, details of hinge: 22, internal (ventral) view, LV intact, RV only preserved in region between lateral teeth of LV; 23, same as 22, ventral part of resilium partially removed; 24, same as 22, posterior half of remains of RV separated and deflected, showing anterior tooth of RV still partially encased in socket between anterior lateral and central teeth of left valve, posterior half of remains of RV as in situ; 25, same as 22, posterior view, all regions of RV external to hinge removed, lateral surface of lateral tooth of LV exposed; 26, same as 22, anterior view; 27, right view, teeth of LV mostly exposed, only a small portion of RV between lateral teeth of LV preserved (tip of teeth reconstituted); 28, same as 27, posterior half of remains of RV extracted and deflected; 29, posterior half of remains of RV in Fig. 28 magnified, interior (left) view. cl, central portion of ligament; hc, hinge (central tooth of left valve); hl, hinge (lateral tooth of left valve); hr, hinge (tooth of right valve); hs, hinge (secondary tooth of right valve); ll, lateral portion of ligament; lv, left valve; rv, right valve. Scale: distance between lateral teeth in Fig. 22 = 7 mm.

The mantle edge of *Plicatulostrea* has a greater richness of papillae than in the known species of *Plicatula*; the inner folds of *P. australis* lack papillae (Watson, 1930: fig. 2), whereas very small papillae are found on the inner fold of *P. gibbosa* (pers. obs.). The dendritic projections of the palps, located between both palps, are very characteristic of Pectinoidea; they are small but present in *P. gibbosa* (pers. obs.) and are represented by a single small projection in *Plicatulostrea* (Fig. 16; dp); *P. australis* apparently lacks such papillae (Watson, 1930). The digestive tubes are very similar in all plicatulids, however, they are slightly longer anteroposteriorly in *Plicatulostrea* (Fig. 15). The auricle is divided into two chambers in *Plicatulostrea* (Fig. 18), not found in other plicatulids, although this condition can be found in other filibranch bivalves (e.g., Arcidae, Simone & Chichvarkhin, 2004). The wide connection between the visceral ganglia found in *Plicatulostrea* (Fig. 21) is also present in other plicatulids (Watson, 1930: fig. 7). The invasion of the gonad into the mantle lobes, well developed in *Plicatulostrea*, is apparently not as developed in the other plicatulids.

Except for some shell characters, such as the hinge, there is apparently no other well-established synapomorphy for Plicatulidae. Every character cited in the literature appears to be a plesiomorphy (e.g., filibranch gills) or is shared with the closely related families Pectinidae and Spondylidae (e.g., shell auricles, dendritic projection of palps). However, a few derived anatomical characters can be attributed to Plicatulidae as is so far known, such as elongation of the stomach, the straight fashion of the gills and the wide connection between the visceral ganglia. The total atrophy of the foot and pedal ganglia appears to be another synapomorphy, because a foot is present in the other Pectinoidea, even in those possessing a valve attached to hard substrata (e.g. in spondylids). It is interesting to emphasize that spondylids are attached to the substratum by the left valve, whereas plicatulids are attached by the right valve.

Plicatulostrea onca is not a rare species and is easily accessible. The late recognition of this species could be because of its inconspicuous mode of life and its oyster-like appearance. The most recent inventories of the Thai fauna do not refer to any kind of flat plicatulid (e.g., Swennen et al., 2001; Robba et al., 2002). Three species have been reported for the area, all belonging to the genus *Plicatula*: *P. chinensis* Mörch, 1853 (= *P. imbricata* Menke, 1843); *P. simplex* Gould, 1861, and *P. muricata* Sowerby, 1873. Because of the strong shell undulations, none of these can be confused with *P. onca*.

The eastern Pacific species *Plicatula anomioides* Keen, 1958, appears to belong to the genus *Plicatulostrea*, because it is ample and flat (Keen, 1971: fig. 206). *Plicatulostrea onca* differs from *P. anomioides* by its rich shell colour, by totally lacking sculpture (*P. anomioides* has fine radiating riblets), by a thinner shell wall and by a proportionally wider hinge. As in the case of *P. onca*, *P. anomioides* had been confused with other similarly shaped species of unrelated groups, being described relatively late despite its commonness (Keen, 1958; 1971).

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THAI ABSTRACT

หอยสองฝา *Plicatulostrea onca* เป็นหอยในวงศ์พลิคาทูลิดี้อยู่สกุลและชนิดใหม่ ซึ่งค้นพบได้ก่อนหินในแนวน้ำขึ้นน้ำลงในอ่าวทุ่งกระเบนบริเวณอ่าวไทยฝั่งตะวันออก การค้นพบนี้เป็นผลจากการศึกษาเปลือกและกายวิภาคของเนื้อเยื่อ หอย *Plicatulostrea* มีความแตกต่างจากหอยพลิคาทูลิดี้อย่างอื่น ๆ โดยมีเปลือกเรียบและมีพื้นบานพับบนเปลือกขวายาว รวมทั้งลำตัวแบนมาก นอกจากนี้ *P. onca* ยังมีจุดเรียงในแนวรัศมีจากยอดเปลือก ส่วนกายวิภาคภายในเป็นไปตามลักษณะของพลิคาทูลิดทั่วไป แต่มีส่วนที่แตกต่างคือ จำนวนปุ่มเนื้อเยื่อที่ขอบของแมนเทิล และการแทรกของต่อมเซลล์เพศ (gonad) เข้าไปยังเนื้อเยื่อแมนเทิล รายงานนี้ให้ข้อคิดเห็นและรายละเอียดทางชีววิทยาบางประการเกี่ยวกับหอยสองฝาวงศ์พลิคาทูลิดี้อยู่

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