

## On the identity of *Neptunea lyrata* (Gmelin, 1791) (Gastropoda: Buccinoidea), with description of *Neptunea excelsior* sp. nov. from the northern West Pacific

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**Abstract:** The original descriptions of *Neptunea lyrata* (Gmelin, 1791) and its synonyms are compared to the type material stored in NMW and to specimens assigned to this species. *N. lyrata* is found to be restricted to the North East Pacific, distinct from any of the West Pacific species. The North West Pacific shells, previously assigned to *N. lyrata*, are described as *Neptunea excelsior* sp. nov.

**Introduction:** “*Buccinids - cones from cold waters*” (Von Cosel, 1986: 10). This citation, here translated from French, is still the best citation to start any text about cold-water whelks. In particular, the genus *Neptunea* is blessed with numerous species that have nicely shaped and vividly coloured shells.

The systematics of this genus are moderately well-known. The taxonomy, however, is without doubt among the most complicated matters within **Buccinidae** because distinct species may have similar-looking forms in combination with a high degree of variation within a single species. The main goal of our revision (Fraussen & Terryin, 2007) was to highlight this variation and to present a new platform for further studies to build upon. “*There still remain many taxonomic problems to be solved. Taxonomic decisions are not an easy task and for some details our current knowledge on Neptunea is still not sufficient to reach any conclusion but only to formulate a question or a speculative reflection. We have written these down, taking the risk that some of them may give an unscientific impression, but still are of the opinion that more information might be more useful than no information.*” (Fraussen & Terryin, 2007: 34). Ten

years later, however, virtually no new or additional information has been published and only few of the many questions have been answered since.

In the meantime, our study on Arctic whelks continues and we gather more information and additional insight. While our goal in the revision in 2007 was to show variability and to assemble morphotypes within the correct species they belong to, our present knowledge seems to indicate that the separation between East and West Pacific is deeper for the more southern located *Neptunea* species. The West Pacific shells assigned to *N. lyrata* are distinct from the “real” East Pacific *N. lyrata* occurring around the type locality. We found no available name for the West Pacific species, as all synonyms formerly assigned to *N. lyrata* belong to East Pacific specimens.

The northeastern Pacific species are under study in McLean’s North-Eastern Pacific Gastropods-project (Geiger et al., 2015). Species from Japan and adjacent waters are under study in Japanese institutions. We are therefore looking forward to a number of interesting forthcoming publications about *Neptunea*.

Nevertheless, new species are easily published and we risk facing synonyms being created or that precious key-species receive a name that is based on personal names that are not related to natural history or the characteristics of the species (notwithstanding the fact that family members or pets are worth being honoured) or derived from useless facts. We therefore feel the urge to publish this iconic West Pacific species before it receives a name that does not do justice to the majestic visual beauty of the shell, and describe it as *Neptunea excelsior* sp. nov.

**Abbreviations:**

- DA:** collection Dmitry Alexeyev, Russia  
**KF:** collection Koen Fraussen, Belgium  
**NMW:** National Museum of Wales, Cardiff, England  
**NMST:** National Science Museum, Tokyo, Japan  
**ZMMU:** Zoological Museum of Moscow University, Russia  
**ZIN (formerly ASL):** Zoological Institute of Russian Academy of Sciences, St.-Petersburg, Russia.

**Systematics****Buccininoidea** Rafinesque, 1815

**Buccinidae** are heterogenic, as already stated by Powell (1929 and 1965), and in the near future this family will be split in more than one. Discussing the supra-generic taxa is beyond the scope of the present paper and instead of using the name **Buccinidae** in the conservative way as a name for the whelks, we prefer to use the name of the order.

Genus *Neptunea* Bolten in Röding, 1798

“*Lade 60. Neptunea. Das Neptunus-Horn*” Röding, 1798: 115.

**Type species:** *Neptunea antiqua* (Linnaeus, 1758). For an account on the synonymy and taxonomic history of the genus we refer to Nelson (1976: 139-141) and Fraussen & Terryn (2007: 38).

*Neptunea lyrata* (Gmelin, 1791)

Text figs 1-2, 3, Figs 1-11, 35-39, 63-65

*Buccinum liratum* Martyn, 1784: fig. 43, (rejected by I.C.Z.N.).

*Murex glomulus cereus* Chemnitz, 1788: 281-282, pl. 169, fig. 1634, (rejected by I.C.Z.N.).

*Murex lyratus* Gmelin, 1791: 3531.

*Fusus succinctus* Menke, 1829: 53.

*Chrysodomus middendorffii* Cooper, 1859: 370 (misspelled as *middendorffii*).

*Neptunea lyrata lyrata* (Martyn) (part) – Golikov, 1963: 144-148 (part), pl. 19, fig. 2b, (not pl. 19, fig. 2a, nor pl. 20, fig. 1a-b).

*Neptunea lyrata lyrata* var. *phoenicea* (Dall) – Golikov, 1963: 144-148, pl. 19, fig. 2b.

*Neptunea lyrata* (Gmelin, 1791) “East Pacific form” (part) – Fraussen & Terryn, 2007: 30, 44-48 (part), text fig. 21, pl. 7, pl. 154 (not pl. 1-6, nor pl. 8).

**Type material:** The holotype of *N. lyrata* in NMW nr. NMW.Z.1981.118.00243 in the Tom Pain collection (for an account on the history of the whereabouts of this shell

we refer to Fraussen & Terryn, 2007: 44-45, text fig. 21 and pl. 154).

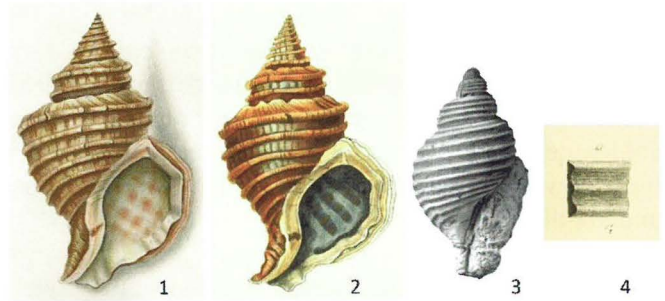
*Buccinum liratum* Martyn, 1784, vol. 2, fig. 43, (rejected by I.C.Z.N.) was based on a single shell and even though Martyn did not explicitly designate a type, this single specimen is the holotype by monotypy according to I.C.Z.N. 73.1.2.

Gmelin did not explicitly designate a specimen, but according to I.C.Z.N. 73.1.4, his reference to the illustration by Martyn (1784: fig. 43) is to be treated as a designation for *Murex lyratus* Gmelin, 1791 (I.C.Z.N. 73.1.4).

This also counts for *Fusus succinctus* (I.C.Z.N. 73.1.4), as the description by Menke (1829: 53) refers to figure 1634 by Chemnitz (1788), which is a copy of this same figure 43 by Martyn (1784).

Nelson, in his PhD-thesis, designated a neotype from the Aleutians (USNM 22044), but his work remained unpublished and was therefore never validated.

We could not trace the specimen of *N. middendorffii* collected by Cooper, which is a single specimen and according to I.C.Z.N. 73.1.2, this single specimen is the holotype by monotypy. Cooper (1859: 370) also refers to a detail of the sculpture of “*Tritonium (Fusus) decemcostatum*” figured by Middendorff (1849: 138 plate 4, fig. 15).



**Text figs**

**1.** *Buccinum liratum* Martyn, 1784, type figure taken from Martyn (1784: fig. 43).

**2.** *Murex glomulus cereus* Chemnitz, 1788, type figure taken from Chemnitz (1788: pl. 169, fig. 1634).

**3.** *Cymatium (Linatella) pacificum* Dall, 1909, from the Miocene of Coos Bay, Oregon. Type figure taken from Dall (1909: 57, pl. 6, fig. 10).

**4.** Detail of the sculpture of “*Tritonium (Fusus) decemcostatum*” figured by Middendorff and referred to by Cooper (1859: 370) for his description of *Chrysodomus middendorffii*. Taken from Middendorff (1849: plate 4, fig. 15).

**Type locality:** Southeastern Alaska. (Fraussen & Terryn, 2007: 45).

Gmelin (1791: 3531) recorded “Habitat ad sinum R. Georgii”, which is a translation of the locality given by Martyn: “K. George Sound, Rade de S. George”. Some later authors wrongly understood this locality as King George Sound, Hudson Strait, Labrador, in the north-western Atlantic. An old map (1793-1794) by George Vancouver situated “the empire of King George III” at the Chicagoff and Baranoff islands (at present Alexander Archipelago, SE Alaska). Whether the type was collected in the vicinity of these islands or at Unalaska Island (Eastern Aleutians) is still uncertain.

The type locality of *Chrysodomus middendorffii* is Whidby Island, Juan de Fuca Strait, Washington: “A single specimen collected by Dr. Cooper on the shores of Whidby’s island, in the Straits of Fuca, ...” (Cooper, 1859: 370).

**Synonymy and taxonomic history:** It is known that the shell figured by Martyn as *Buccinum liratum*, as well as *Buccinum saturum* (= *Neptunea ventricosa* (Gmelin, 1791)), were collected during the third and last voyage of Captain James Cook in the summer of 1778. The *Resolution* was in the harbour of Unalaska between the 2<sup>nd</sup> and 22<sup>nd</sup> of October 1778 for urgent reparations and there is a high likelihood that the shell was collected during that stay. Even though it might be elsewhere, for example during the small exploration by William Bligh after anchoring at Prince William Sound on the 12<sup>th</sup> of May 1778. To make matters even more interesting: Prince William was the third son of King George, and the type locality was written as “K. George Sound”, which provides sufficient material for speculations about the type locality. In 1780, when the *Resolution* anchored after its long voyage, this shell arrived in England. Martyn purchased 2/3 of all shells collected during Cook’s third voyage (Dance, 1986: 70) and “distributed” them to “the cabinets of Mr. Banks, Dr. Fordyce and two other gentlemen”. Indeed, the specimen of *Buccinum liratum* is listed by Martyn (under “In what Cabinet preserv’d” in the “Explanatory Table”) as being the property of “Mr. Fordyce”. The shell disappeared for a long time without any further published record, for example in auction catalogues or so, until 2007. For an account on the history of the whereabouts of this shell we refer to Fraussen & Terryn, 2007: 44-45.

Chemnitz described *Murex glomus cereus* (1788: 281-282) and states his figure (1788: pl. 169, fig. 1634) is a copy of the figure of *Buccinum liratus* by Martyn (1784; fig. 43). The work of Chemnitz was rejected by I.C.Z.N. as not being binominal; therefore the name *Murex glomus cereus* is not available: “*Der Wachstock*.”

*Murex Glomus cereus, seu cereus conglomeratus, testa transversim sulcata (sulcis latiusculis profundioribus) et costata (costis validis) colore obscure luteo, cauda*

*flexuosa adscendente, labro duplicato, sinuoso, subdentato, labio replicato crassiusculo.*

*Th. Martyn Univers. Conchol. Tom.2. fig.43. Ridged – Buccinum liratum from King Georges Sound.*

*Unter den Südseeischen Schnecken, die den Gelegenheit der Cookischen Reisen nach Europa gebracht worden, ist diese Gattung eine der größten, ansehnlichsten und seltensten, davon man nur wenig Exemplare muss gefunden haben. Ihre Figur gleicht einem ausgewundenen Wachstocke: daher ich ihr vorläufig diesen Namen gegeben, weil ich es nicht wagen wollen, den gemeinen Englischen Namen beizubehalten, und sie nur schlechthin die Gefurchte zu nennen. Im Mittelländischen Meere findet man einige Gattungen, die der jetzigen sehr nahe kommen, und von mir im 4ten Bande dieses syst. Conchyliencabinet den fig. 1252 seq. beschrieben worden. Aber die jetzige ist von jenen dennoch gar sehr unterschieden, und behauptet einen ausnehmenden Vorzug.*

*Dass ihr ansehnlicher Bau von sehr dicken Queerribben und tiefen breiten Queerfurchen umgeben werde; dass ihre Windungen stark voneinander absetzen, und nahe den der Nath, besonders auf den beiden ersten und grössesten Stockwerken einen wulstigen Gürtel tragen, dass die Mundöffnung eiförmig sei und sich unterwärts sehr verengere, und in einen geraden rinnenartigen Auslauf endige; dass der verlängerte Schwanz sich nur wenig erhebe, und also nur als cauda subascendens anzusehen sei; dass die innere weißlich gefärbte Lippe sich wie ein Wulst an die Spindel hinanlege; dass die äußere sehr verdickte Lippe an der inneren Seite faltenartige Zähne habe; dass diese Schnecke ein dunkelgelbliches Farbenkleid, fast wie Murex Pyrum trage, werde ich aufmerksamen Conchylienfreunden, welche dieses alles aus der meisterhaft von Herrn Degen getroffenen Abbildung schon ohnedem erkennen können, nicht erst sagen dürfen. Bei den Cookischen Reisen ist diese Gattung, welche am richtigsten den Muricibus beigesellet wird, in König Georgens Sund auf Neu-Seeland gefunden worden.“* From Chemnitz, 1788: 281-282.

Menke described *Fusus succinctus* (1829: 53) and refers to figure 1634 by Chemnitz (1788), which is a copy of the type figure of *Buccinum liratus* by Martyn (1784; fig. 43): “1096 *Fusus succinctus*, Mke. testa ovato-fusiforime, crassa, pallide lutea, sulcata et striata: sulcis crassis, obtusis, rotatis, superius planata; spira conico-acuta; anfractibus medio cariniferis; cuda breviuscula. *Murex glomus cereus*, Chemn. 3. 2. (e. Sch.)”. From Menke, 1829: 53.

Cooper described *Chrysodomus middendorffii* (1859: 370), but misspelled the name as *middendorffii*. Carpenter (1873a: 534, 597 and 663) corrected the spelling to *middendorffii* (however, it was again spelled *middendorffii* in his Index of species, 1873b: 36), while Golikov corrected it to *middendorffi* in his synonymy list



(1963: 144, under *N. lyrata*). According to I.C.Z.N. 32.5.1 the spelling with a single “-f” is an incorrect original spelling, to be corrected to the correct personal name (in this case “Middendorff”). In addition, according to I.C.Z.N. 33.4, it is an incorrect subsequent spelling (instead of an emendation) to change double “-ii” to single “-i”. The question may arise if the *lapsus calamus* in Cooper’s text was a missing “-f” (thus with double “-i”) rather than an “-i” instead of a “-f” (and thus a single “-i”). According to another new molluscan species’ name in the same paper (*Nassa gibbsii* Cooper 1859: 371), a new fish in the preceding paper and a new crustacean in the subsequent paper, all written with a double “-ii”, we can assume that Carpenter was right in emendating the spelling to “*middendorffii*” in keeping the double “-ii”.

*Cymatium (Linatella) pacificum* Dall, 1909 from the Miocene of Coos Bay, Oregon (Dall, 1909: 57, pl. 6, fig. 10) was synonymised with *N. lyrata* by Golikov (1963: 145), here followed (Fraussen & Terryn, 2007: 45), but the shell figured by Dall looks more similar to *Clinopegma* rather than to *Neptunea*. We therefore exclude *Cymatium (Linatella) pacificum* Dall, 1909 from synonymy with *N. lyrata*.

**Range and habitat:** Restricted to the eastern part of the North Pacific, up to Alaska (Petersburg and Kodiak Island) in the north. Specimens collected at low tide at Mitkof Island (Alaska) are found close to commercial fishing activities such as crab pots and canneries and are most probably brought up and rejected by fishermen, although they were found laying eggs in protected areas under the cannery docks at extreme low tide.

**Remarks:** Quite some specimens recently collected at Mitkof Island (Alaska, 2004–2007) and some specimens collected at Unalaska Island (Nelson MS, 1974: pl. 12 fig. 2-3) still have a shape and sculpture similar to the holotype that was collected 200 years ago. This uniformity of the morphotype during those years is evidence for a genetic stability. We observed, however, an important difference in the presence of secondary spiral cords. Specimens collected over the past few decennia virtually all have a spiral cord on the subsutural slope, which becomes gradually more prominent towards the penultimate and body whorl. Specimens collected about 100 years ago usually lack this prominent subsutural cord. Specimens collected about 200 years ago (for example the type) also lack this cord. Moreover, they usually have broad spiral cords and, consequently, look more similar to the western Pacific specimens.

**Comparison:** *Neptunea lyrata* can easily be distinguished by the rather narrow spiral cords, the higher number of spiral cords and by the shape of the subsutural

slope, which is slightly concave with one prominent spiral cord. On the penultimate and body whorl, this cord is almost as strong as a primary cord. Specimens collected about 100 years ago usually lack this prominent subsutural cord.

For differences with *N. excelsior* sp. nov., we refer to the comparison under the description below.

For differences with other East Pacific species, we refer to Clark et al. (in preparation).

### *Neptunea excelsior* sp. nov.

**Figs 12-34**

*Neptunea lyrata* (Gmelin, 1791) (part) of auctors, from western Pacific, not *Murex lyratus* Gmelin, 1791.

Among them:

*Neptunea lyrata lyrata* (Martyn) (part) – Golikov, 1963: 144-148 (part), pl. 19, fig. 2a, pl. 20, fig. 1a-b (not pl. 19, fig. 2b).

*Neptunea lyrata* (Gmelin, 1791) “West Pacific form” (part) – Fraussen & Terryn, 2007: 30, 44-48 (part), pl. 1-6 (not pl. 7-8).

**Type material: Holotype:** 143.3 mm, Russia, western Sakhalin, Tatarskii Proliv, in tangle nets, 40 m deep, 1999, ZMMU-Lc-40509. **Paratype 1:** 141.1 mm, same locality, 100 m deep, 1990, KF4334; **Paratype 2:** 133.0, Russia, Sakalin, La Pérouse Strait, 1986, KF-1064; **Paratype 3:** 121.0 mm, Russia, northern Primorje, Sea of Japan, 120 m deep, KF- 7714; **Paratypes 4-5:** 126.7-138.0 mm, Russia, northern Primorje, Sea of Japan, 1997, KF- 4438; **Paratype 6:** 122.6 mm, Russia, Sea of Japan, KF- 6458; **Paratype 7:** 156.6 mm, Russia, Sea of Japan, near Wladiwostok, Ascolda Island, 250 m deep, 1993, KF-4275; **Paratypes 8-9:** 183-186 mm, Russia, Sea of Japan, near Wladiwostok, Posjet Bay, 80-100 m deep, KF-116; **Paratype 10:** 156.6 mm, Russia, Sea of Okhotsk, by fishermen from Petropawlovska-Kamtschatki, 1990, KF-0835; **Paratype 11-12:** 134.1-160,9.6 mm, Russia, southern Sea of Okhotsk, 65-80 m deep, 1990, KF-4437; **Paratype 13:** 146.2 mm, Russia, western Sea of Japan, close to Corean border, 30 m deep, KF-6457; **Paratype 14:** 141.2 mm, Russia, Sakhalin, Tatar Strait, Delangle Harbour, 20 m deep, 1995, DA- C088.

**Type locality:** Russia, western Sakhalin, Tatar Strait (Tatarskii Proliv), 40 m deep.

**Range and habitat:** *Neptunea excelsior* sp. nov. is known to us from offshore E China and Korea in the west, along the Russian coast of the Sea of Japan, (Vladivostok, Primorsky Cray) to central Sakhalin, along the northern Japanese coast (Hokkaido) to the southern Sea of Okhotsk off the Kurile Islands and the southern Bering Sea off Kamchatka Peninsula (Gulf of Kronotsky) in the north.

The single record of *Neptunea lyrata* from Portugal (Algarve, off Manta Rota, - 300 m) never received a second confirmation. The specimen in question was figured by Macedo et al. (1999: 190) and looks conspicuously similar to some specimens from Kuril Islands. It is without doubt an accidental introduction (Fraussen & Terryn, 2007: 46; Fraussen & Vanleke, 2017: 116).

*Neptunea excelsior* sp. nov. is collected sympatrically with *N. hedychra* off north Hokkaido and southern Sakhalin.

*Neptunea excelsior* sp. nov. lives on sand, sandy-silt, mud, occasionally with stones. Bathymetric range between about 18 (Gulf of Aniva) and 300 m. Specimens are trawled at 250 m off Ascolda Island (Russian coast of the Sea of Japan, Primorye) and between 200 and 300 m off Shibetsu (Hokkaido).

**Description:** Shell large for the genus (up to 190 mm), moderately thick, solid and heavy. Spiral sculpture prominent. Shape rather broad, base elongate, aperture large. Subsutural slope straight, wide. Colour pale to reddish brown on spiral interspaces with paler spiral cords. Those spiral cords are usually white or with white blotches, occasionally darker than ground colour. Occasionally with larger and darker, irregularly shaped flecks. Occasionally pale. Apex decollate in all adult and subadult specimens, about 6 (holotype) to 7 (paratype 9) teleoconch whorls remaining. Upper spire whorls sculptured with 2 strong, primary spiral cords, here called keels. Adapical keel projecting more than abapical cord, resulting in a rather triangular shape (upside-down). Interspaces broad, smooth (holotype) or covered with fine secondary spiral cords (paratype 1) of equal strength, occasionally of unequal strength. Penultimate whorl with 2 (holotype) or 3 (paratype 1) such keels, slender specimens occasionally with a fourth keel partly concealed under suture with subsequent body whorl (paratype 9). Keels usually growing broader along penultimate whorl. Body whorl with about 8 broad, flattened keels, adapical ones strong, towards base gradually weaker; siphonal canal with a few indistinct broad, flat spiral cords. Keels broad, slightly flattened, glossy (holotype) or covered with several fine secondary spiral cords on top (paratype 1). Interspaces broad, slightly narrower on base; smooth or covered with 1 to 7 broad, but obscure secondary spiral

cords, occasionally with a single, centrally situated stronger secondary spiral cord. Axial sculpture consisting of fine, incremental lines; straight on body whorl, but weakly opisthocyrt on subsutural slope. Body whorl occasionally with an axial varix (paratype 1). Aperture semi-oval. Columella weakly twisted, rather smooth, keels of preceding whorl visible through parietal callus. Callus thin, glossy, white. Outer lip thick in fully adult specimens; slightly angulated when following shape of spiral sculpture. Siphonal canal moderately short, broad, open

**Comparison:** *Neptunea excelsior* sp. nov. has a characteristic spiral sculpture consisting of broad, prominent, moderately flattened keels (primary spiral cords), with smooth interspaces that may be covered with fine secondary spiral cords. The upper (adapical) keel usually circumpasses a wider diameter, while the lower (abapical) keels circumpass a slightly narrower shape along the lower cords, giving the shell a broader diameter at the shoulder.

Variability is high in shape, colour and secondary spiral sculpture. While typical *N. excelsior* sp. nov. have 2 visible keels along the upper spire whorls, slender specimens may show 3 keels and occasionally even 4 keels (paratype 9). Fresh specimens may have a contrasting pattern with vivid reddish brown blotches or axial strikes, while other specimens may be quite pale. Most shells in collections fade after a number of years. The keels (primary spiral cords) are more or less uniform throughout the species, maybe sometimes broader or with a more flattened top. The secondary spiral cords, however, are typical of the genus and thus highly variable: ranging from fine, but moderately sharp cords like in paratype 1, over obscure threads to absent and leaving a smooth surface as seen in the holotype.

Specimens of *N. excelsior* sp. nov. from the southeastern part of the range, off Japan (*Neptunea lyrata* “Japan form” as figured by Fraussen & Terryn, 2007: 47, pl. 1-2) looks somewhat different in shape and sculpture and further study will prove whether they are a form of *N. excelsior* or belong to a distinct species. Those specimens from near the eastern boundary usually have slender shells with smoother spiral cords and a darker colour. The subsutural cord is occasionally separated from the suture by a subsutural interspace.

*Neptunea lyrata*, the “real” species from the East Pacific, differs by the more elevated, quite sharper primary spiral cords; the higher number of spiral cords along the spire whorls, the usually more convex whorls; the usually broader shape; the shorter siphonal canal; the usually smaller adult size and the usually darker colour.

*Neptunea hedychra* Fraussen & Terryn, 2007, collected sympatrically with *N. excelsior* sp. nov., differs in having narrower primary spiral cords with a quite triangular profile and rather sharp top (instead of flattened with some spiral lines), upper spire whorls with 1 keel and lower spire whorls with 2 primary spiral cords, interspaces with 1 prominent secondary spiral cord in the middle, a bigger body whorl with a broader and weakly concave or straight subsutural slope (instead of the weakly convex subsutural slope in *N. excelsior* sp. nov.), usually slightly, twisted incremental lines (instead of straight), an elongate base and a slightly longer siphonal canal and the characteristic reddish pattern with dominant, alternating dark and pale (or white) axial streaks (see Figs 44-48).

*Neptunea cuspidis* Fraussen & Terryn, 2007 (before *Neptunea lyrata* form *obsoleta* Golikov, 1963, of the West Pacific *Neptunea lyrata*, not *N. lyrata* Gmelin, 1791) differs from *N. excelsior* sp. nov. by having a smoother shell with weak primary spiral cords (the 2 cords on the spire whorls circumpass an equal diameter while in *N. excelsior* sp. nov. the upper cord forms a wider diameter) and without secondary spiral cords, a broad and rather straight subsutural slope (instead of weakly convex), sharp irregular incremental lines, a rough surface, a long siphonal canal, usually a pale colour and a smaller adult size. Shells are easily distinguished by the shape of the upper whorls, which is laterally straight (because of the spiral cords that project evenly) and with a shallow interspace (see Figs 49-53).

*Neptunea decemcostata* (Say, 1826) from the West Atlantic differs from *N. excelsior* sp. nov. in having a narrower and concave subsutural slope; the keels and interspaces have a smoother surface (instead of covered with a number of fine, secondary spiral threads), the usually paler colour with darker spiral cords and the smaller adult size (see Figs 40-43, 54-62).

**Etymology:** *Neptunea excelsior* sp. nov. is derived from the Latin adjective “*excelsus*”, meaning “high” or “lofty”, but spelled as the comparative “*excelsior*” meaning “higher”, “being superior” or “being eminent”, referring to the more than noble shell that rises well above all other *Neptunea* species known to collectors and scientists.

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zum Verkaufe dargeboten wird. Heinrich Gelpte, Pymont, vi + 123

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#### Plate 1:

**1-11: *Neptunea lyrata*** (Gmelin, 1791)

**1:** *Buccinum liratum* Martyn, 1784, type figure taken from Martyn (1784: fig. 43.

**2-4:** Holotype of *Buccinum liratum* Martyn, 1784; of *Murex lyratus* Gmelin, 1791; as well as of *Fusus succinctus* Menke, 1829; 124.2 mm, NMW.Z.1981.118.00243

**5-8:** 102.0 mm, Alaska, Mitkof Island, Petersburg Harbour, under pier near cannery, at low tide, leg. Y. Terry, 2006, KF-6076.

**9-11:** 91.9 mm, same locality, KF-6076.

#### Plate 2:

**12-21: *Neptunea excelsior*** sp. nov.

**12-17:** Holotype, 143.3 mm, Russia, western Sakhalin, Tatarskii Proliv, in tangle nets, 40 m deep, 1999, ZMMU.

**18-21:** Paratype 1, 141.1 mm, same locality, 100 m deep, 1990, KF-4334.

#### Plate 3:

**22-29: *Neptunea excelsior*** sp. nov.

**22-23:** Paratype 3, 121.0 mm, Russia, northern Primorje, Sea of Japan, 120 m deep, KF- 7714.

**24-25:** Paratype 12, 160,9.6 mm, Russia, southern Sea of Okhotsk, 65-80 m deep, 1990, KF-4437.

**26-27:** Paratype 2: 133.0, Russia, Sakalin, La Pérouse Strait, 1986, KF-1064.

**28-29:** Paratype 9, 186 mm, Russia, Sea of Japan, near Wladiwostok, Posjet Bay, 80-100 m deep, KF-1166.

#### Plate 4: comparison

**30-34: *Neptunea excelsior*** sp. nov.

**30-31, 33:** Holotype, 143.3 mm, Russia, western Sakhalin, Tatarskii Proliv, in tangle nets, 40 m deep, 1999, ZMMU.

**32, 34:** Paratype 1, 141.1 mm, same locality, 100 m deep, 1990, KF4334.

**35-39: *Neptunea lyrata*** (Gmelin, 1791)

**35, 37:** 111.8 mm, Alaska, Mitkof Island, Petersburg Harbour, under pier near cannery, at low tide, leg. Y. Terry, 2006, KF-6076.

**36, 38:** 102.0 mm, same locality, same specimen as Figs 5-8.

**39:** 91.9 mm, same locality, same specimen as Figs 9-11.

**40-43: *Neptunea decemcostata*** (Say, 1826).

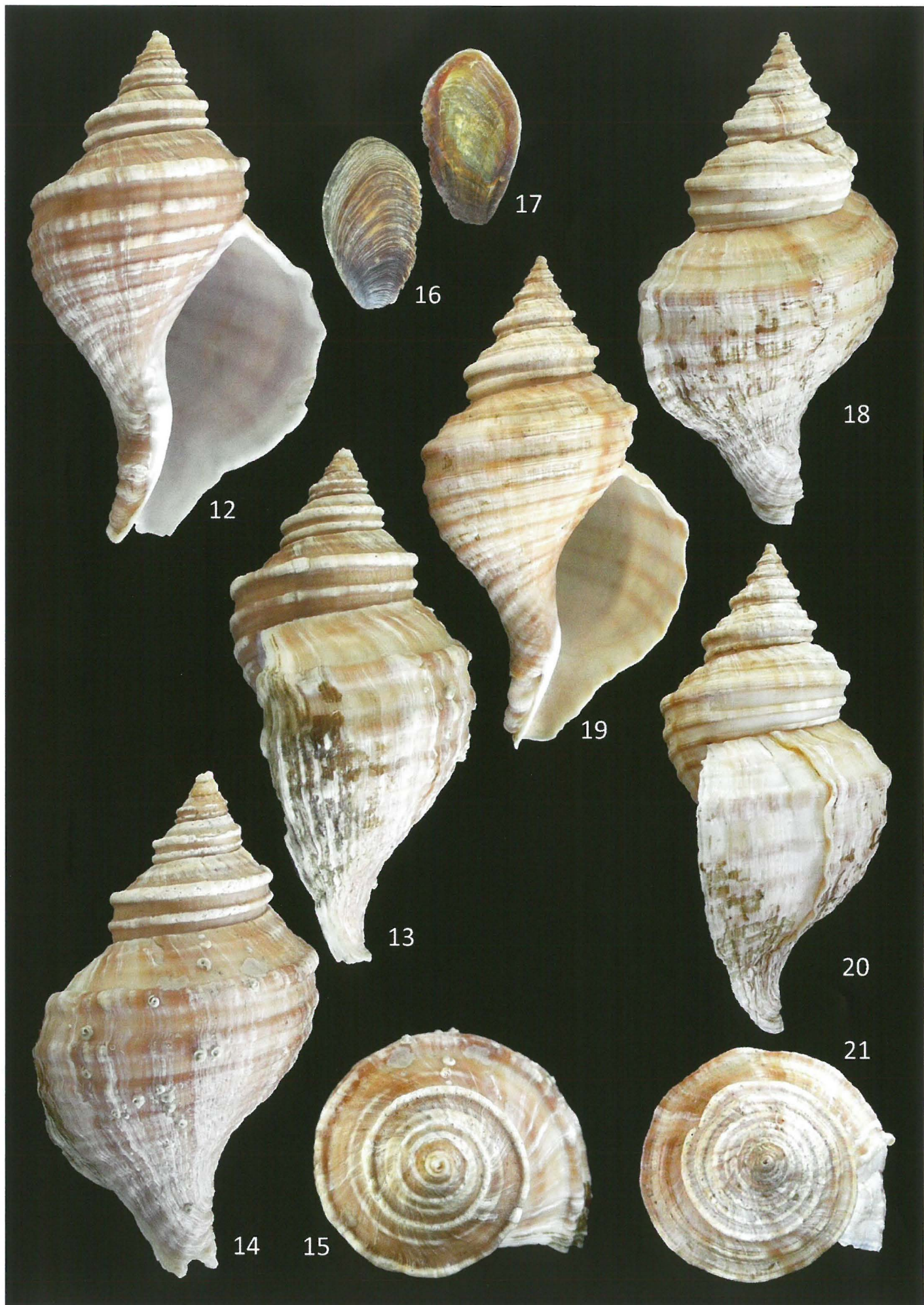
**40-42:** 86.4 mm, Atlantic Ocean, Canada, Nova Scotia, Annapolis Basin near center-channel-buoy, on rocks and clay, 18 m deep, 1/1991, KF-0989.

**43:** 94.8 mm, Atlantic Ocean, Canada, Maine, Big Cranberry Island, Mount Desert, at Great harbour, in lobster traps set off Mount desert, 7-9 m deep, KF-1417.

















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*N. excelsior*



35

*N. lyrata*



40

*N. decemcostata*



31



36



32



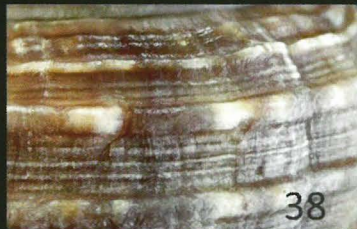
37



41



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38



42



34



39



43





44

*N. hedychra*



45



49

*N. cuspidis*



46



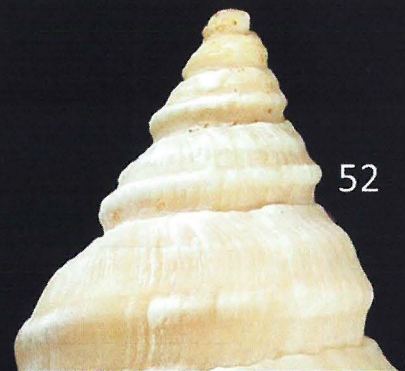
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**Plate 5:** Comparison.**44-48:** *Neptunea hedychra* Fraussen & Terry, 2007

**44-46:** 127.9 mm, holotype, Japan, Hokkaido, off Kushiro, 200-300 m, NSMT-73831.

**47-48:** 118.3 mm, paratype 8, Russia, southern Sea of Okhotsk, 150 m deep, KF-3250.

**49-53:** *Neptunea cuspidis* Fraussen & Terry, 2007

**49-51:** 106.3 mm, paratype 4, Russia, southern Sea of Okhotsk, off Sakhalin, 150 m deep, KF-2764.

**52:** 98.9 mm, paratype 1, Russia, southern Sea of Okhotsk, off Sakhalin, 120 m deep, KF-2591.

**53:** 133.1 mm, paratype 7, same locality, KF-2961.

**Plate 6:****54-62:** *Neptunea decemcostata* (Say, 1826)

**54-57:** 86.4 mm, Atlantic Ocean, Canada, Nova Scotia, Annapolis Basin near center-channel-buoy, on rocks and clay, 18 m deep, 1/1991, KF-0989.

**58-60:** 94.8 mm, Atlantic Ocean, Canada, Maine, Big Cranberry Island, Mount Desert, at Great harbour, in lobster traps set off Mount desert, 7-9 m deep, KF-1417.

**61-62:** 80.7 mm, Canada, Nova Scotia, Brown's Bank, on sand between Placopecten and rocks, trawled, 6/1995, KF-2352.

**63-66:** *Neptunea lyrata* (Gmelin, 1791), 111.6 mm, Alaska, Mitkof Island, Petersburg Harbour, under pier near cannery, at low tide, leg. Y. Terry, 2006, KF-6076.