

*Anodonta Wahlamatensis*, Lea. Tr. Am. P. S. v. 6, p. 78. = *A. triangulata*, Trask. *A. rotundovata*, Trask. From Sacramento River.

*Anodonta angulata*, Lea. Tr. Am. P. S. v. 6, p. 97. = *A. feminalis*, Gould. *A. Randalli*, Trask. From upper San Joaquin.

*Helix Oregonensis*, Lea. Trans. Am. P. S. v. 6, p. 100. Point Cypress, Monterey County.

*Helix Nickliniana*, Lea. Trans. Am. P. S. v. 6, p. 100. Tomales Bay and Deadman's Island.

*Helix Californiensis*, Lea. Trans. Am. P. S. v. 6, p. 99. Point Cypress, Monterey County.

*Lymnaea exigua*, Lea. Trans. Am. P. S. v. 9, obs. v. 3. San Antonio Arroya.

*Lymnaea pallida*, Adams. Journal Boston Nat. Hist. Soc. v. 3. San Antonio Arroya.

*Physa heterostropha*, Say. Nicholson's Ency. Am. Edition. Los Angeles.

*Melania occata*, Hinds. Voy. of the Sulphur, pl. 15, f. 5. Sacramento River.

*Melania seminalis*, (*Paludina*, Hinds.) Voy. Sulphur, pl. 16, fig. 22. Sacramento River.

*Planorbis trivolis*, Say. Nicholson's Ency. Am. Ed. Hern Lake. Slightly varies from the Michigan specimens.

*Planorbis ammon*, Gould. Proc. Boston Soc. Nat. Hist. v. 5, p. 129. Lagoons, Sacramento Valley.

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*Descriptions of twenty-eight new species of Acepala and one Gasteropod, from the Cretaceous formations of Nebraska Territory.*

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**PHOLADOMYA UNDATA.** Shell oval or ovate, moderately ventricose, anterior end rounded, posterior extremity rounded chiefly from below, cardinal border nearly straight; base somewhat broadly curved; beaks rather elevated, incurved, placed between the centre and the anterior end; surface (of cast) ornamented by numerous, regular, distinct, concentric undulations, which are crossed by much smaller radiating costae, scarcely marked in the depressions between. Length about one inch.

As we have not seen the hinge of this species, we refer it with doubt to the above genus. The radiating costae are about equal, the spaces between, and in consequence of being marked only on the concentric undulations, and not in the intermediate depressions, furnish a character by which even fragments of the species may be at once identified.

*Locality and position.* Mouth of Judith River, in a sandstone supposed to be same as No. 1 of the series.

**GONIOMYA AMERICANA.** Our specimens of this interesting shell are too imperfect to give a clear idea of its form, though the direction of the lines of growth indicate an oblong or very narrow oval outline, with a narrowly rounded anterior and subtruncate posterior. Laterally the valves must have been considerably compressed. The beaks are small, not much elevated, and placed in advance of the centre. On the two extremities the costae, which are quite distinct, traverse the shell obliquely backwards from near the hinge to the base, while those originating immediately in front and behind the beaks, converge and meet at various distances down the sides of the shell, so as to form arched or convex angles of from 20° to 30°. Surface ornamented by fine irregular lines of growth, crossed by regular, equi-distant, radiating rows of minute transparent granules, placed at regular distances from each other. These granules are so small as to be scarcely visible without the aid of a strong magnifier, under which they look like minute drops of melted amber.

In its surface markings this species resembles *G. Dubois* of Prof. Agassiz, (*Etudes critiques sur les Mollusques fossiles*, tab. 1.) but in our species the converging costae continue to meet at the same acute angles as far as they can be traced towards the points of the beaks, while on the beaks of *G. Dubois* and

other, allied species, these angles are truncated, and the opposite costæ united by horizontal bars. Perfect specimens would probably show other differences. This is, we believe, the first species of this genus found in America. According to Prof. Bronn, (*Index Palæontologicus*,) five species have been hitherto described from the whole cretaceous system, two of which were from the Neocomien, two from the green sand, and one from the true chalk.

*Locality and position.* Moreau Trading Post, No. 5 of the series.

**SOLENSUBPLICATUS.** Shell very thin and fragile, elongated, cardinal and basal margins straight and parallel; buccal extremity obliquely truncate, anal end rounded from below, both ends gaping; beaks nearly at the anterior extremity, not distinct from nor rising above the hinge line. Six to eight broadly rounded, very faint plications radiate from behind the beaks obliquely backwards to the posterior margin, to which they appear to have imparted a slightly waved outline; surface marked with faint lines of growth, and minute transverse closely arranged striæ, which do not radiate from the beaks, but traverse the shell at right angles to its longitudinal diameter. Length 1·15 inches; breadth ·26 inch; height ·42 inch.

The fine transverse striæ on this shell are only visible under a high magnifying power, and appear to have been as well marked on the inside as on the exterior, distinct impressions of them being left on internal cast.

*Locality and position.* Moreau river, No. 5 of the series.

**TELLINA GRACILIS.** Shell elliptical, moderately compressed, extremely thin and fragile; buccal margin rounded; posterior end contracted, subtruncate, and having a broad obsolete ridge passing from the beaks obliquely backwards to the postero-basal margin; cardinal border convex before and concave behind the beaks; lower border forming a regular elliptical curve; beaks rather depressed, and located a little behind the centre; surface marked with fine lines of growth. Length ·90 inch; breadth of left valve ·17 inch; height ·60 inch.

The above description is made out from a single left valve, so attached to the matrix as to show only external characters.

*Locality and position.* Mouth of the Judith, in a sandstone supposed to be the same as No. 1 of the series.

**TELLINA EQUILATERALIS.** Shell elliptical, compressed, moderately thick, extremities rounded; anterior end slightly broader than the posterior; beaks small, not elevated, located a little in advance of the middle; surface marked with fine regular concentric lines. Length of right valve 1·15 inches; breadth ·12 inch; height ·57 inch.

We have of this species but one right valve, showing none of its internal characters. The position of its beaks, as well as its much greater thickness, preclude the idea of its being an opposite valve of the last.

*Locality and position.* Same as preceding.

**TELLINA ? CHEYENENSIS.** Shell ovate, compressed, very thin; anterior extremity rounded; posterior end subtruncate or rounded from above, and very obtusely angular below; base forming an elliptic curve; beaks somewhat elevated, placed a little in advance of the middle, surface ornamented with fine lines of growth and numerous small regular concentric wrinkles, becoming mere lines near the beaks and on the extremities. Length ·88 inch; breadth ·36 inch; height ·67 inch.

We have only seen the outside of this specimen.

*Locality and position.* Forks of Cheyenne River, No. 4 of the series.

**TELLINA SCITULA.** Shell elliptical, small, thin, much compressed, curved so as to be convex on the left, and slightly concave on the right sides; extremities narrowly rounded, the anterior end being wider than the posterior; beaks small, nearly central; base forming a regular elliptic curve; surface polished, and marked with distinct lines of growth. Length ·50 inch; breadth ·13 inch; height ·30 inch.

*Locality and position.* Moreau River, No. 5 of the series.

**TELLINA SUBELLIPTICA.** Shell small, ovate or elliptical, thin, much compressed; anterior extremity rounded; posterior end somewhat rounded or subtruncate; beaks small, not much elevated, a little in advance of the centre; surface rather faintly marked with fine lines of growth. Length  $\cdot 50$  inch; breadth  $\cdot 12$  inch; height  $\cdot 32$  inch.

This species is chiefly distinguished from the last by its more broadly rounded extremities, less distinct lines of growth, and greater thickness.

*Locality and position.* Cherry Creek, Upper part of No. 5 of the series.

**TELLINA PROUTII.** Shell ovate, much compressed, very thin and fragile; extremities rounded: posterior end somewhat contracted, and having a broad, indistinct ridge passing from the beaks obliquely backwards to the postero-inferior margin, the outline of which it may have slightly modified; cardinal border convex before, and concave behind the beaks; umbones nearly central, elevated, somewhat gibbous, closely approximate; surface ornamented with fine but distinct lines of growth; internal laminae of the shell marked with faint, very fine radiating lines; sinus of the pallial impression oblong, obtuse or subtruncate at the extremity, about one-third the length of the shell. Length  $2\cdot 42$  inches; breadth  $\cdot 83$  inch; height  $1\cdot 60$  inches.

We have not seen the hinge of this shell. The species is dedicated to Dr. H. A. Prout, of St. Louis, Missouri, to whom we are indebted for the only specimens we have seen.

*Locality and position.* Fort Benton, No. 4 of the series.

**CYTHEREA DEWEYI.** Shell subcircular or slightly oval, somewhat compressed; beaks moderately elevated, a little in advance of the centre; surface ornamented by distinct irregular lines of growth; lunule small, narrow, oval or broad lanceolate, not very distinctly impressed; muscular impressions shallow, anterior one narrow ovate; posterior broad ovate, acutely angular above; pallial impression having a rather deep triangular sinus, forming at the apex an angle of  $55^\circ$ ; border smooth. Length  $\cdot 96$  inch; breadth  $\cdot 51$  inch; height  $\cdot 85$  inch.

Specimens slightly more elongated, but apparently identical with this, occur on the Yellow-stone River in a bed we have considered the upper part of No. 4, but which may represent No. 5. This species is dedicated to Prof. Chester Dewey, of Rochester University, N. Y.

*Locality and position.* Moreau River, No. 5 of the series.

**CYTHEREA NEBRASCENSIS.** Shell subcircular, much compressed; beaks somewhat elevated, small, a little in advance of the centre; ligamentary cavity long and very narrow lanceolate; surface marked with rather faint lines of growth. Length  $\cdot 70$  inch; breadth  $\cdot 28$  inch; height  $\cdot 60$  inch.

The much more compressed form of this shell will serve to distinguish it at once from the last.

*Locality and position.* Same as preceding.

**CORBULA VENTRICOSA.** Shell small, very thin, subglobose, nearly equivalve; anterior end broadly rounded; posterior extremity abruptly contracted into a narrow prolongation; beaks elevated, ventricose, a little behind the centre of the globose part of the shell; surface marked with distinct irregular lines of growth; cardinal tooth of right valve prominent, flattened; posterior muscular impression deep; pallial impression having a broad triangular sinus. Length  $\cdot 55$  inch; breadth  $\cdot 26$  inch; height  $\cdot 27$  inch.

*Locality and position.* Same as last.

**CORBULA MOREAUENSIS.** Shell small, subovate, ventricose, rounded in front, suddenly contracted and somewhat attenuate behind; beaks prominent, situated behind the middle of the broadest part of the shell, rather inclined backwards; surface ornamented with strong, regular, elevated concentric lines, nearly equaling the spaces between. Length about  $\cdot 27$  inch; breadth  $\cdot 10$  inch; height  $\cdot 16$  inch.

We have not yet seen the left valve of this shell, nor the interior of the right,

from which the above description is made out. The species may be distinguished from the last by its much stronger and more regular concentric lines.

*Locality and position.* Same as last.

*CORBULA? GREGARIA.* Shell very small, somewhat triangular, subglobose; right valve more ventricose than the left; beaks nearly central, gibbous, that of the right valve elevated considerably above the left, incurved; surface polished and marked with a few faint, irregular, concentric wrinkles, indicating stages of growth; hinge having under the beaks a single prominent tooth in each valve; anterior muscular attachment indistinct, posterior raised upon a strongly projecting lamina; palcal inpressions scarcely sinuous. Length .13 inch; breadth .10 inch; height .13 inch.

It is with much doubt we refer this little shell to the genus *Corbula*. In the inequality of its valves, as well as in the character of its hinge, it agrees exactly with that genus, but we have seen no species of *Corbula* having either of the muscular attachments raised upon a projecting plate, as in this shell. In this respect it is more like *Cordilla* of Deshayes, but it appears to want the spoon shaped projection of the hinge of that genus; and it is the posterior, instead of the anterior muscular attachment that here forms a projecting plate. We suspect it belongs to an undescribed genus.

*Locality and position.* Yellow-stone River, one hundred and fifty miles from mouth, where it is found in vast numbers compacted together in concretions, in the upper part of No. 4 of the series.

*ASTARTE GREGARIA.* Shell small, subtriangular, rounded below and at the extremities, nearly equilateral, valves moderately convex; beaks much elevated, rather pointed, incurved, approximate, slightly turned forward; escutcheon narrow lanceolate; lunule somewhat broadly lanceolate or narrow ovate, not very distinctly impressed; surface ornamented by small, but distinct concentric undulations, and much finer lines of growth; border smooth; muscular impressions shallow. Length .21 inch; breadth .14 inch; height .21 inch.

*Locality and position.* Yellow stone River, from a bed probably near the top of No. 4, if not in No. 5 of the series. Abundant.

*NUCULA SCITULA.* Shell ovate, rather ventricose, rounded in front, somewhat contracted and narrowly rounded behind; umbonal region gibbous; beaks prominent, incurved, approximate, located in advance of the middle; surface marked with distinctly elevated, regular concentric lines, about equal to the spaces between, and stronger on the middle than towards the extremities of the valves; dorsal border marked by a distinct longitudinal groove behind the beaks. Length .39 inch; breadth .21 inch; height .22 inch.

From *N. ventricosa* of Hall and Meek, (see vol. 5, new series, Trans. Am. Acad. Arts and Sciences.) to which it bears some resemblance, this may be distinguished by its beaks being located nearer the anterior end, and by its larger size and comparatively smaller concentric lines.

*Locality and position.* Moreau River, No. 5 of the series.

*NUCULA EVANSI.* Shell elongate, narrow elliptical, thin, moderately convex; cardinal margin nearly straight, marked with a distinct longitudinal groove on each valve; extremities rounded, posterior end compressed and slightly gaping; inferior border forming an elliptical curve, with sometimes a faint impression near the middle; beaks very small, not much elevated, located in advance of the centre; surface polished and marked with faint lines of growth; muscular impressions indistinct; teeth of the hinge numerous, closely interlocked. Length .72 inch; breadth .22 inch; height .32 inch.

Dedicated to Dr. John Evans, U. S. Geologist of Oregon Territory.

*Locality and position.* Moreau River, No. 5 of the series.

*NUCULA EQUITRATERALIS.* Our specimens of this shell are only casts. The species may be characterized as follows: subelliptical, rather convex; extremities narrowly rounded; beaks central, somewhat elevated; umbonal region gibbous; muscular impressions comparatively large, distinct, but not deep; border

smooth; teeth of the hinge numerous, short, obtuse, closely interlocking. Length .64 inch; breadth .21 inch; height .25 inch.

Even casts of this species may always be known from the last, by the central position of the beaks and more narrowly rounded extremities.

*Locality and position.* Same as last.

*NUCULA SUPPLANA.* Shell small, oval, compressed; anterior end obliquely subtruncate from the beaks a little more than half way down; posterior end round, base broadly rounded; beaks prominent, compressed, located about half way between the centre and the anterior end; surface (of cast) having a few faint indications of concentric undulations; teeth of hinge moderately long; border smooth. Length .25 inch; breadth .09 inch; height .20 inch.

Of this little *Nucula* we have only seen casts. It may be known from other species from these formations by its short compressed form and elevated beaks. It is rare.

*Locality and position.* Yellow-stone River, one hundred and fifty miles above mouth, in a bed supposed to be upper part of No. 4 of series.

*NUCULA CANCELLATA.* Shell rather large and thick, ovate or subtriangular, ventricose, pearly within; anterior end short, obliquely truncate, posterior end longer, narrowly rounded; umbonal region gibbous; beaks somewhat elevated, slightly incurved; escutcheon lanceolate; lunule ovate, flattened, but scarcely impressed; surface ornamented by numerous flatly rounded, simple, closely arranged, radiating costæ, which are crossed by small, irregular, concentric wrinkles, and finer indistinct lines of growth; border neatly crenulated. Length .93 inch; breadth .50 inch; height .65 inch.

This beautiful *Nucula* resembles in its surface markings *N. pectenata* of Sowerby, (Min. Conch. vol. 2, page 209, fig. 6, 7,) but differs in the form and depth of its lunule, which is rather narrow ovate and very shallow, while in Sowerby's species it is distinctly cordate and deeply impressed. The muscular impressions, though large, are much more shallow than in *N. pectenata*. The radiating costæ of our species become obsolete on the lunule and escutcheon, and are about five times as broad as the grooves between, near the border. The anterior muscular impression is bordered by a distinct ridge, which extends nearly up to the beaks.

*Locality and position.* Moreau River, No. 5 of the series.

*NUCULA PLANOMARGINATA.* Shell ovate, somewhat compressed, pearly within; anterior end very short, obliquely truncate; posterior end long and narrowly rounded, dorsal and ventral margins forming, from the beaks backwards, elliptical curves; beaks much elevated; surface unknown; muscular impressions faint; border smooth. Length .95 inch; height .60 inch; breadth .26 inch.

We have only seen internal casts of this species, the shell being always left adhering to the matrix, from which we infer the surface was ornately marked. It may be at once distinguished from the last by its more compressed form and smooth border.

*Locality and position.* Same as last.

*PECTUNCULINA PARVULA.* Shell very small, obliquely oval, somewhat compressed, inequilateral; buccal end and base rounded; anal extremity rounded and slightly extended obliquely downwards; cardinal border short, and having a narrow, well defined, longitudinally striate area on each valve; beaks small, not much elevated, about midway between the centre and the anterior end; surface polished and marked with lines of growth, sometimes crossed by faint indications of radiating costæ; hinge having in each valve three or four teeth on each side of the central triangular ligamentary pit; interior marked with faint radiating grooves terminating in distinct crenulations at the border. Length .18 inch; breadth .10 inch; height .16 inch.

This little shell might, upon a hasty examination, be mistaken for *Cardium rarum*, (Evans and Shumard's unpublished MS.), but it possesses all the characters of the above genus. The shell is often so translucent that the internal radiating grooves are seen through it.

*Locality and position.* Yellow-stone River, No. 5 of the series.

*ARCA (CUCULLÆA) CORDATA.* Shell thick and strong, subovate, somewhat triangular or cordiform, very ventricose, abruptly rounded before, obliquely subtruncate behind, and forming a broad curve below; umbones gibbous, much elevated, incurved, located near the anterior end; ligamentary area very short, deeply excavated, grooved and finely striated longitudinally; surface marked with strong imbricating lines of growth and indistinct radiating costæ. Length 2.03 inches; breadth 1.77 inches; height 1.96 inches. Length of ligamentary area 1.25 inches; breadth of do. .30 inches.

This species, in its thickness and general appearance, approaches *Cucullæa Nebrascensis*, (Owen,) but may be distinguished by its shorter buccal extremity, more elevated, approximate and incurved beaks, and especially by its much shorter and narrower ligamentary area. There is in our specimen a distinct sulcus starting from before the beak of each valve, and extending obliquely downwards to a point a little behind the middle of the shell, where it dies out before reaching the border. When viewed on either end, this shell presents a beautiful cordate form.

*Locality and position.* Moreau Trading Post, No. 5 of series.

*ARCA (CUCULLÆA) SHUMARDI.* Shell oval, ovate, somewhat globose, rather thin, obliquely subtruncate behind, rounded before, and forming an elliptic curve below; umbones very gibbous, oblique, moderately elevated, incurved, and located a little in advance of the centre; surface ornamented by distinct lines of growth, crossed by numerous, rather indistinct radiating costæ; ligamentary area straight, narrow, moderately excavated, grooved and striated longitudinally; hinge having in each valve three or four transversely striated; oblique, lateral teeth on each side, and small, irregular, intermediate transverse ones in the centre; border smooth. Length (specimen about four times the medium size) 1.67 inches; breadth 1.28 inches; height 1.40 inches.

This is one of the most abundant and beautiful bivalves found in the cretaceous rocks of the upper Missouri country. It varies much in form, some of the specimens being more nearly of an ovate form, in consequence of the anal region being extended, and the beaks more oblique, while others are shorter and more rotund. These two forms are quite well enough marked to constitute a specific distinction, if they were not connected by numerous intermediate ones. As these differences are not due to age or size, we are inclined to regard them as sexual. In old shells the radiating costæ are usually obsolete. In some specimens a single raised line may be seen passing from behind the beak of the right valve to the posterior border, following the direction of the raised edge of the posterior muscular impression. This is rarely seen on the left valve. We dedicate the species to Dr. B. F. Shumard, of St. Louis, Missouri.

*Locality and position.* Same as last.

*MYTILUS ATTENUATUS.* Shell much elongated, slightly arcuate; extremities compressed and rounded; anterior end narrow; beaks nearly terminal; surface (of cast) faintly marked with lines of growth. Length 1.90 inches; breadth .50 inch; height .56 inch.

From *M. Galpinianus* and *M. Meekii*, (Evans and Shumard,) this species may be known by its much greater proportional length and less gibbous beaks. Having only seen casts, we know nothing of its surface markings.

*Locality and position.* Same as last.

*AVICULA? FIBROSA.* Shell ovate, subtriangular, very oblique, pointed at the beaks, somewhat rounded below; beaks small, acute, placed at the anterior extremity, and scarcely rising above the hinge; right and left valves alike, convexly arched from the beaks to the base; posterior wing somewhat flattened and apparently broadly rounded; surface ornamented by strong, rounded, radiating plications, which bifurcate very irregularly, and are crossed by strong concentric undulations, so as to give the surface, which is otherwise smooth, a subnodose appearance. Some of our specimens must have been as much as two inches in length when perfect.

It is with much doubt we place this shell in the above genus, as we have in none of our specimens seen any indications of an anterior wing. It is also worthy of note, that the substance of the shell is composed of an internal lamellar, and an external fibrous portion, like *Pinna*, from which, however, it differs in having a posterior wing-like expansion. The radiating costæ are faint or wanting on the wing.

*Locality and position.* Forks of Cheyenne River, No. 4 of series.

**INOCERAMUS VENTRICOSUS.** Shell ovate, oval or oblong, extremely inflated, very thin and fragile, structure entirely fibrous; cardinal border straight; anterior end rounded, posterior end apparently subtruncate, base broadly curved; umbonal region remarkably gibbous; beaks oblique, located at the anterior extremity; surface marked with fine regular imbricating lines of growth, and occasionally with a few faint irregular concentric undulations. Length about 4.30 inches; breadth (of right valve) 1.70 inches; height 2.75 inches. Thickness of thickest part of shell, near the hinge, .12 inch; do. of thinnest part near border .03 of an inch.

The most striking characteristics of this species are its remarkably ventricose form, extreme thinness and entirely fibrous structure, there being no internal lamellar portion, as is generally the case in this genus. In our specimens the calcareous matter has been replaced by ferruginous and silicious matter, so as to preserve the original structure of the shell perfectly. If the left valve is as gibbous as the right, the transverse diameter of the shell must be considerably greater than its height. The beak of one of our specimens appears to have been truncated. We have only seen right valves.

*Locality and position.* Mouth of Judith River, in sandstone, supposed to be the same as No. 1 of the series.

**PECTEN NEBRASCENSIS.** Superior valve suborbicular, moderately compressed, ornamented by twelve to fifteen strongly elevated costæ about equal to the spaces between; surface marked with very fine, closely arranged concentric lines, crossed by equally fine crowded radiating striæ; buccal ear (imperfect in our specimens) apparently triangular, rather distinctly marked with radiating costæ, crossed by concentric striæ stronger than on the body of the valve; annal ear smaller, triangular, concave on the margin, and marked with distinct concentric lines. Length and breadth .49 inch.

From *P. venustus* of Dr. Morton, (Synopsis, pl. 5, fig. 5,) to which this species appears to be closely allied, it may be distinguished by the fine radiating striæ. In some of the specimens the costæ occasionally bifurcate, while the radiating striæ never run exactly parallel to the costæ, but pass very obliquely along their sides. These striæ are so fine as to be invisible without the aid of a lens. We have not seen the inferior valve.

*Locality and position.* Yellow-stone River, one hundred and fifty miles from its mouth, in a bed supposed to represent No. 5 of the series.

**NATICA SUBCRASSA.** Shell obliquely oval or oblong, thick; spire rather short; volutions three to three and a half, convex; suture distinct or somewhat grooved; surface marked with strong lines of growth, which rise, on the body whorl, into distinct imbricating wrinkles; outer lip bevelled; inner lip rather thick, and nearly covering the small umbilicus; aperture ovate, oval, or elliptical, nearly as obtusely rounded above as below. Length .95 inch; breadth .87 inch; apical angle about 93°.

It is possible there may have been other surface markings than those mentioned above, as all our specimens are so worn that fine lines would have been obliterated, had they existed. The species may be known from those found in the higher members of the series in this region, by its stronger lines of growth, and greater thickness.

*Locality and position.* Mouth of Judith River, from a sandstone supposed to be the same as No. 1 of the series, where it is associated with *Tellina gracilis*, and *T. equilateralis*.