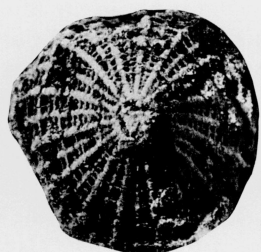
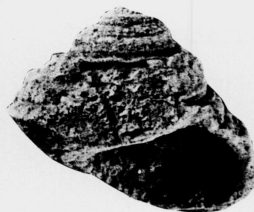


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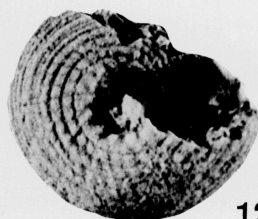
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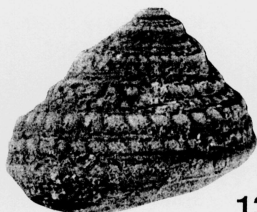
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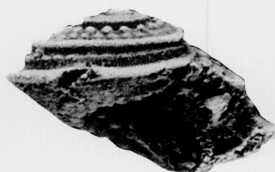
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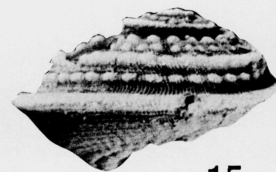
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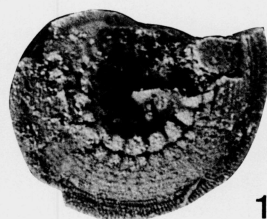
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Family TURBINIDAE Rafinesque, 1815

Subfamily LIOTIINAE Adams & Adams, 1854

Genus *Arene* Adams & Adams, 1854

Type species: *Turbo cruentatus* Megerle von Mühlfeld, 1829, by subsequent designation (Woodring, 1928), Recent, West Indies.

Arene olympiata Squires & Goedert, sp. nov.

(Figures 10–17)

Diagnosis: An *Arene* having a bicostate juvenile body whorl with the anteriormost carina keel-like, and a noded, tricostrate adult body whorl; base of body whorl with about 10 spiral ribs, anteriormost ones stronger and noded.

Description: Shell small, conical-turbiniform, of five angulate whorls with tabulate shoulders. Spire moderately elevated. Protoconch, of about two whorls, very low, covered with very closely spaced growth lines. Keel on periphery of spire whorls beginning after 1½ whorls. Noded spiral ribbing on ramp area of spire whorls beginning after two whorls, with rib nearest the suture the first developed. Spire whorls with four beaded spiral ribs (two on the ramp, one on the periphery, and one anterior to the periphery). Spiral rib on tabulate shoulder the strongest, forming a carina. On specimens less than 5 mm height, body-whorl ramp area with two, equal-sized and noded spiral ribs (interspaces with or without a spiral riblet) and three carinae on the periphery. Anteriormost carina on periphery forming a keel; the other two carinae weaker and noded, with the posteriormost one strongest. On specimens greater than 5 mm height, the three carinae on the periphery approaching each other in strength, all having nodes. Interspaces between carinae with one to two spiral riblets. Anteriormost keeled carina strongly delimiting boundary of base of body whorl. Base moderately convex, covered with about 10 spiral ribs that become stronger and more noded toward the umbilicus. Umbilicus deep, bordered by strongly noded spiral funicular cord. Peristome circular. Inner lip narrow and crenulate. Outer lip moderately thick. Growth lines prosocline.

Dimensions of holotype: Height 5.7 mm, width 7.3 mm.

Holotype: LACMIP 11359.

Type locality: CSUN loc. 1563, Larch Mountain, Washington, 47°59'03"N, 123°8'12"W.

Paratypes: LACMIP 11360–11362, CSUN loc. 1563.

Discussion: Forty-four specimens were found, all from CSUN loc. 1563. Preservation is generally good, although about one-half of the specimens are fragments. There is a growth series, with specimens ranging in height from 0.25 to 12.5 mm. The largest specimen is abraded.

The progressive change on the periphery from three unequal-strength carinae in the juvenile to three equal-

strength carinae in the adult is important to note for any future identifications of this species. If it were not for the presence of a growth series of the new species at the type locality, it is likely that two species would have been recognized.

The new species is similar to *Arene mcleani* Squires (1988:9–10, figs. 9–11), the only other species of *Arene* from Paleogene rocks of the Pacific coast of North America. *Arene mcleani* is from "Capay Stage" strata in Lockwood Valley and the Orocochia Mountains, southern California, and from "Capay Stage" strata in Baja California Sur, Mexico (Squires, 1988, 1991; Squires & Demetrio, 1992). The new species differs in the following features: always two spiral ribs on ramp area, three spiral carinae on periphery of the body whorl, carinae thinner and not as strongly noded, carinae interspaces can have a single spiral riblet, anteriormost carina on periphery keel-strength in juveniles and somewhat keel-like in early adults, base more convex and with many more spiral ribs (10 rather than three) that are weaker and less noded.

Etymology: The species is named for the city of Olympia, Washington, which is near the type locality of the new species.

Order Caenogastropoda Cox, 1960

Family VOLUTOMITRIDAE Gray, 1854

Genus *Conomitra* Conrad, 1865

Type species: *Mitra fusoides* Lea, 1833, by subsequent designation (Fischer, 1884), middle Eocene, Alabama.

Conomitra capitolina Squires & Goedert, sp. nov.

(Figures 18–21)

Diagnosis: A *Conomitra* with 23 axial ribs on body whorl, subangulate shoulder, weak spiral ribs on teleoconch, and four teeth on inner lip.

Description: Shell small, fusiform. Protoconch conical, multispiral, of about three whorls, smooth. Teleoconch of about five whorls. Suture deeply incised. Spire elevated with numerous axial ribs, extending from suture to suture. Shoulder subangulate on all teleoconch whorls. Body whorl with 23 axial ribs, becoming much weaker to obsolete on neck. Teleoconch with spiral striae, not noded where they cross axial ribs. Spiral striae most prominent on neck and siphonal fasciole. Aperture elongate, narrow. Anterior siphonal canal short. Inner lip with four teeth, extending deep into aperture; anteriormost tooth weakest.

Dimensions of holotype: Height 6.8 mm, width 3.5 mm.

Holotype: LACMIP 11363.

Paratype: LACMIP 11364.

Type locality: CSUN loc. 1563, Larch Mountain, Washington, 47°59'03"N, 123°8'12"W.

Discussion: Eight specimens were found; they range in height from 4 to 6.8 mm. Seven of the specimens are from CSUN loc. 1563; one is from CSUN loc. 1564.

The new species resembles certain specimens of *Conomitra fusoides* (Lea, 1833:169, pl. 6, fig. 176) from the middle Eocene Gosport Sand in Alabama. *Conomitra fusoides* has considerable variation, and the specimens that resemble the new species are illustrated in Palmer (1937: pl. 66, figs. 24, 26). The new species differs in the following features: shell less tumid, neck more constricted, and axial ribs less prominent on neck of body whorl.

The new species also resembles LACMIP collection specimens of *Conomitra graniformis* (Lamarck, 1803:59–60; Cossmann & Pissarro, 1910–1913:pl. 42, fig. 202 bis 3) from middle Eocene (Lutetian Stage) rocks of the Paris Basin, France. The new species differs in the following features: axial ribs stronger except on the neck and siphonal fasciole and axial ribs not noded anteriorly near the suture.

The only other species of *Conomitra* from the Pacific coast of North America is *Conomitra washingtoniana* (Weaver, 1912:52–53, pl. 2, fig. 16; 1942:497–498, pl. 95, figs. 8, 9, 16; Dickerson, 1915:pl. 11, figs. 11a, 11b) from the upper middle Eocene Cowlitz Formation, southwestern Washington. Turner (1938) reported that Weaver's species may also be in the upper "Umpqua Formation" of southwestern Oregon. Cernohorsky (1970) assigned Weaver's species to genus *Conomitra*. The new species differs from *C. washingtoniana* in the following features: a slightly narrower shell, well-developed axial ribbing rather than a nearly smooth shell with microscopic spiral lines and faint axial ribs on the shoulder, and a subangulate shoulder.

Conomitra ranges from the Paleocene to the Pliocene (Wenz, 1943). Although the genus has been found in the Old World, it was most common in Paleocene to upper Eocene rocks of the Gulf Coast (Palmer, 1937; Palmer & Brann, 1965–1966).

Etymology: The species is named in reference to the proximity of the type locality to both Capitol Peak, in the Capitol Forest, and to the capitol of Washington State.

Subclass Heterobranchia Gray, 1840

Order Heterostropha Fischer, 1885

Family ORBITESTELLIDAE Iredale, 1917

Genus *Orbitestella* Iredale, 1917

Type species: *Cyclostrema bastowi* Gatliff, 1906, by monotypy, Recent, Victoria, southeast Australia.

Orbitestella palaiopacifica Squires & Goedert, sp. nov.

(Figures 22–26)

Diagnosis: An *Orbitestella* with an upper whorl surface crossed by narrow axial ribs, a keel-like carina on the

shoulder, axial ribs in the interspace between the carina on the basal margin and the carina on the edge of the umbilicus, and a wide but deep umbilicus showing overlapping whorls in its interior.

Description: Shell minute, discoidal, with a flat spire and a sunken apex. Protoconch about 1½ whorls, apparently smooth. Teleoconch 2 to 2½ whorls with a hump (ridgelike swollen area) in middle of whorl on first teleoconch whorl but near the deep suture on subsequent whorls. Teleoconch whorls crossed with about 70 axial ribs, tending to become obsolete near outer lip. A well-developed keel-like carina on the shoulder just anterior of the hump; keel-like carina beginning at about 2¾ whorl, very wide for one-half of whorl, then narrower. Another carina on the basal margin. Area between these two carinae smooth and sloping inward. A third carina on the prominent edge of the umbilicus. Interspace between carina on the basal margin and carina on the edge of the umbilicus concave with numerous axial ribs. Umbilicus wide and deep. Interior of umbilicus showing overlapping whorls. Area between carina on edge of umbilicus and the suture smooth and steep. Aperture quadratelike with sinuations corresponding to the hump, to the keel-like carina, and to the carina on the basal margin.

Dimensions of holotype: Height 0.30 mm, diameter 0.53 mm.

Holotype: LACMIP 11365.

Type locality: CSUN loc. 1563, Larch Mountain, Washington, 47°59'03"N, 123°8'12"W.

Paratypes: LACMIP 11366–11367.

Discussion: Fourteen specimens were found, all about 0.3 mm in height. Ten of the specimens were found at CSUN loc. 1563; two were found at locality 1564.

The new species is most similar to *Orbitestella plicatella* (Cossmann, 1888:225, pl. 11, figs. 43–45; Cossmann & Pissarro, 1910–1913:pl. 6, fig. 105-2; Gougerot & Le Renard, 1977:14–15, fig. 16; Dolin et al., 1980:pl. 3, figs. 34a, 34b) from middle Eocene through lower Oligocene (middle Lutetian through lower Stampien) strata in the Paris Basin, France (Gougerot & Le Renard, 1977). Lozouet & Maestrati (1982) gave a synonymy of this species. Although the new species and *O. plicatella* have essentially identical basal faces, the new species differs in the following features: many more and stronger axial ribs, axial ribbing on dorsal side stronger, suture deeper, and hump on dorsal surface of whorl located closer to the suture.

The new species is also similar to the only other described Eocene species of *Orbitestella*, which is *O. planibasis* (Gougerot & Le Renard, 1977:14–15, figs. 15a–15c) from middle Eocene through upper middle Eocene (middle Lutetian through lower Bartonian) strata in the Paris Basin, France. The new species differs in the following features: axial ribs narrower and not knoblike, a more