**Explanation of Characters**

1. 0: Oral frame plates proximal to the peristome and separate the peristome from the oral plates absent. 1: Oral frame plates present.
2. 0: Shape of the theca near the stem facet is circular. 1: Triangular in shape. 2: Square in shape.
3. 0: Interambulacral plating (plate series between ambulacra on the oral surface) present. 1: Interambulacral plating absent.
4. 0: Absence of stem (plated columnal with plates stacked on top of one another) from theca. 1: Presence of stem.
5. 0: Region surrounding the periproct (anus) not elevated. 1: Periproctal region elevated.
6. 0: Nature of interambulacral plating is imbricate (following a certain directionality). 1: Tessellate (multiplated without directionality)
7. 0: Ambulacra do not branch on the oral surface. 1: Ambulacra do branch on the oral surface.
8. 0: Stem is attached to holdfast as an adult. 1: Stem is automized from holdfast as an adult.
9. 0: Plating of the holdfast is multielemental. 1: Plating of the holdfast is a single element. 2: Holdfast is cemented. 3: Thecal base is cemented
10. 0: Sessile (unable to change locations as an adult). 1: Vagrant (able to change locations as an adult).
11. 0: Oral plates absent. 1: Oral plates present
12. 0: Plate series proximal to mouth is oral plate series. 1: Plate series proximal to mouth is oral frame plate series. 2: Plate series proximal to mouth is adradial floor plate series.
13. 0: Posterior oral plates (oral plates within CD interray) O1, O6, and O7 present. 1: Only O1 and O6 present. 2: Only O1 and O7 present. 3: Only O1 present.
14. 0: Oral plates are flush with the oral surface. 1: Oral plates are spinous and rise above oral surface. 2: Oral plates are blade-shaped and rise above oral surface.
15. 0: Oral plates relatively small. 1: Oral plates relatively large.
16. 0: O2 and O5 from oral plate series are missing. 1: O2 and O5 from oral plate series are present.
17. 0: Peristome bordered by O2 and O5 (i.e., in contact with O2 and O5). 1: Peristome not bordered by O2 and O5 (i.e., not in contact with O2 and O5).
18. 0: Brachiole facets are located on oral plates. 1: Brachiole facets are not on oral plates.
19. 0: Peristome exposed on the oral surface of the theca. 1: Peristome is subtegmenal, and not exposed at the surface.
20. 0: Primary peristomial cover plates are differentiated from other cover plates in the ambulacral area. 1: Primary peristomial cover plates are absent. 2: Primary peristomial cover plates are undifferentiated from other cover plates in the ambulacral area.
21. 0: Adambulacral floor plates present. 1: Adambulacral floor plates absent.
22. 0: Suturing of adambulacral floor plates to one another is biserial. 1: Suturing of adambulacral floor plates to one another is uniserial.
23. 0: Biserially arranged transverse ridges in food grooves absent. 1: Biserially arranged transverse ridges in food grooves present.
24. 0: Main food grooves extend on outer floor plates. 1: Main food groves extend extend on inner floor plates. 2: Main food grooves extend on thecal plates without floor plates. 3: Main food grooves extend onto thecal plate interiors without floor plates.
25. 0: Adambulacral pores absent in the food groove. 1: Present. 2: Present as podial ba-sins.
26. 0: Absence of secondary abradial floor plates. Presence of secondary abdradial floor plates.
27. 0: Ambulacral floor plates structurally forming part of the thecal wall. 1: Ambulacral floor plates are lying epithecally on theca and do not form part of the wall.
28. 0: Brachioles present. 1: Brachioles absent.
29. 0: Brachiole facets born on center of abambulacral plates. 1: Brachiole facets born from between abambulacral floor plates. 2: Brachiole facets born from abambulacral primary and secondary floor plate pairs. 3: Brachiole facets born from thecal plates without floor plates. 4: Brachiole facets born from oral frame plate sutures. 5: Brachiole facets born from oral plates. 6: Brachiole facets arise from adambulacral floor plates.
30. 0: Brachioles are not coiled. 1: Brachioles are coiled.
31. 0: Brachiole plating is gracile (small). 1: Brachiole plating is robust (larger).

32.0: Shared ambulacra (BC, DE) do not bear brachiole facets. 1: Shared ambulacra do bear brachiole facets.

33. 0: First brachiole of the distal ambulacra branches on the left. 1: First brachiole of the distal ambulacra branches on the right.

34. 0: Brachioles found on both sides of ambulacra. 1: Brachioles restricted solely to the left side of ambulacra.

35. 0: Brachioles are plated biserially. 1: Brachioles are uniserial.

36. 0: Periproct is located between C and D ambulacra (within CD interray). 1: Periproct located between B and C ambulacra (within BC interray). 2: Periproct located at aboral pole.

37. 0: Periproctal membrane absent. 1: Periproctal membrane present.

38. 0: Stem present. 1: Stem absent.

39. 0: Proximal stem width is not greatly expanded with respect to distal stem. 1: Proximal stem width is greatly expanded with respect to distal stem.

40: 0: Plating of the proximal stem is irregular. 1: Plating of the proximal stem is polymeric. 2: Plating of the proximal stem is holomeric.

41. 0: Proximal stem does not have alternating inner and outer columnals. 1: Proximal stem does have alternating inner and outer columnals.

42. 0: Spiraling pivot points on proximal stem are absent. 1: Spiraling pivot points on proximal stem are present.

43. 0: The base of the theca and the stem are not clearly delineated (demarked) from one another. 1: The base of the theca and the stem are clearly delineated from one another.

44. 0: Stem facet is located at the aboral pole (opposite the oral area). 1: Stem facet is located in the area between the B and C ambulacra.

45. 0: Lumen of the stem is relatively large (meaning, mostly hollow) and comprises more than 75% of the total stem diameter. 1: Lumen of the stem is relatively small (not hollow) and comprises less than 75%

46. 0: Stem lumen is circular. 1: Stem lumen is Pentagonal. Stem lumen is triangular.

47. 0: Distal columnals of the stem are of relatively similar thickness (which are thin). 1: Distal columnals are thick and barrel shaped, longer than wide.

48. 0: Oral plates border the periproct on one side. 1: Only interambulacral plates border the periproct. 2: Only thecal plates border the periproct. 3: Both interambulacral and thecal plates border the periproct. 4: Tegmanal plates border the periproct.

49. 0: Distal ambulacra are recumbent against the theca. 1: Distal ambulacra are erect as floor plates. 2: Distal ambulacra are erect as composite structures of multiple plate types.

50. 0: Distal ambulacra do not branch. 1: Distal ambulacra do branch.

51: 0: Coelomic canal absent. 1: Coelomic canal present.

52. 0: Coelomic canal pierces the edge of oral plates. 1: Coelomic canal pierces theca subtegmenally. 2: Coelomic canal pierces the theca.

53. 0: Plates of the theca are irregular. 1: Plates are arranged in blastoid configuration. 2: Plates are arranged in glyptocystitid condition. 3: Plates are arranged in hemicosmitoid condition.

54. 0: Lateral ambulacra (B, C, D, and E) branch. 1: Lateral ambulacra do not branch.

55. 0: Primary peristomial cover plates are undifferentiated with respect to other cover plates and are the same size. 1: Primary peristomial cover plates are larger than other cover plates.

56. 0: Shared cover plates (between lateral ambulacra) present. 1: Shared cover plates present.

57. 0: Cover plates present. 1: Cover plates absent.

58. 0: Cover plate plating is multi-tiered. 1: Cover plate plating is biserial.

59. 0: Hydropore absent. 1: Hydropore located in oral plates. 2: Hydropore located in interambulacral plates.

60. 0: Gonopore absent. 1: Gonopore located in oral plates. 2: Gonopore located in interambulacral plating. 3: Gonopore located in thecal plating.

61. 0: Hydropore and gonopore have separate openings and are not combined. 1: Hydropore and gonopore have confluient openings and are combined.

62. 0: Basals absent or undifferentiated from other thecal plates. 1: One basal plate. 2: Three basals with paracrinoid configuration. 3: Three basals with blastoid configuration. 4: Three equally sized basals. 5: Four basals in glyptocystitid condition. 6. Four basals in hemicosmitoid condition. 7. Four equally sized basals. 8. Five equally sized basals.

63. 0: Arm generating plate (radial plate) absent. 1: Arm generating plate present.

64. 0: Exothecal portion of the composite arm structure (axial and extraxial components) is not incorporated into the wall of the theca. 1: Exothecal portion of the composite arm structure is incorporated into the wall of the theca.

65. 0: No line of radially positioned thecal plates below or along each ambulacrum. 1: Line of radially positioned thecal plates below or along each ambulacrum present.

66. 0: Epispires (exothecal respiration structures, comprising a single pore) are absent. 1: Epispires are present.

67. 0: Epispires are not covered. 1: Epispires are covered with platelets. 2: Epispires are covered with a layer of stereom.

68. 0: Diplopores (exothecal respiration structures, comprising a double pore system) absent. 1: Diplopores present.

69. 0: Endothecal respiratory structures absent. 1: Catispires (parablastoid condition) present. 2: Hydrospires (blastoid condition) present. 3: Pectinirhombs (glyptocystitoid condition) present. 4: Cryptorhombs (hemicosmitoid condition) present. 5: Goniospires present. 6. Corrugated plate margins present. 7. *Carabocrinus*-like condition.