

Supplemental Table 1. Species of echinoderms used in this study, their larger grouping within Echinodermata, formation, state, and country occurrence data, the global or regional stage of the formation occurrence, the species' temporal range, the geographic basin in which it is assigned for the biogeographic study, and references associated with the species' occurrence information. A full citation list of all references included in the table follows below.

Species	Group within Echinodermata	Occurrence	Global/Regional Stage	Temporal Range	Location and Code	References
<i>Asterocystites bohemicus</i>	Diploporeta	Ktaoua Fm, Morocco; Prague Basin, Czech Republic	Middle Caradoc; est. Darwillian-Katian	467.3-445.2	Gondwana (G)	Barrande 1887; Horný 1997
<i>Asteroblastus stellatus</i>	Diploporeta	Kunda Formation, Russia	Dariwilian	467.3-458.4	Gondwana (G)	Eichwald 1862; Kessling 1967
<i>Dactylocystis schmidti</i>	Diploporeta	Saku Member, unkown formation, Estonia	Katian	453-445.2	Baltica (B)	Jaekel 1899; fossilID.info
<i>Estonocystis antropoffi</i>	Diploporeta	Jõhvi Formation, Estonia; Dreimani Formation, Estonia; Paluküla Formation, Estonia	Sandbian	458.4-453.0	Baltica (B)	Jaekel 1899; fossilID.info
<i>Eucystis angelini</i>	Diploporeta	Boda Limestone, Sweden	Katian	453-445.2	Baltica (B)	Angelin 1878
<i>Eumorphocystis multiporata</i>	Diploporeta	Bromide Formation, Oklahoma, USA; Benbolt Formation, Virginia, USA	early Sandbian	458.4-453.0	Western Midcontinent (W); Southern Appalachian basin (A)	Branson and Peck, 1940; Parsley 1982
<i>Fungocystites rarissimus</i>	Diploporeta	Vinice Formation, Czech Republic	Sandbian	453.0	Gondwana (G)	Barrande 1887
<i>Glyptosphaerites leuchtenbergi</i>	Diploporeta	Estonia, St. Petersburg, Russia	Dariwilian	467.3-458.4	Baltica (B)	Volborth 1846; Rõõmusoks 1970; fossilID.info
<i>Gomphocystites indianensis</i>	Diploporeta	Osgood Formation, Indiana, USA	Wenlock	433.4-427.4	Cincinnati Basin (C)	Miller 1889, Frest et al. 2011
<i>Haplosphaeronis oblonga</i>	Diploporeta	Boda Limestone, Sweden; Estonia	Sandbian- Katian	458.4-445.2	Baltica (B)	Angelin 1878; Regnél 1945
<i>Holocystites cylindricus</i>	Diploporeta	Osgood Formation, Indiana, USA; Osgood Formation, Tennessee, USA; Joliet Formation, Illinois, USA	Wenlock	433.4-427.4	Cincinnati Basin (C); Southern Appalachian Basin (A)	Frest et al. 2011
<i>Holocystites salmoensis</i>	Diploporeta	Ellis Bay Formation, Quebec, Canada	Hirnantian	445.2-443.8	Southern Laurentia (S)	Sheffield et al. 2017

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<i>Holocystites scutellus</i>	Diploporida	Osgood Formation, Indiana, USA; Osgood Formation, Tennessee, USA; Joliet Formation, Illinois, USA	Wenlock	433.4-427.4	Western Midcontinent (W)	Frest et al. 2011
<i>Paulicystis densus</i>	Diploporida	Osgood Formation, Indiana, USA	Wenlock	433.4-427.4	Cincinnati Basin (C)	Frest et al. 2011
<i>Pentacystis gibsoni</i>	Diploporida	Osgood Formation, Indiana, USA	Wenlock	433.4-427.4	Cincinnati Basin (C)	Frest et al., 2011
<i>Pustulocystis pentax</i>	Diploporida	Osgood Formation, Tennessee, USA	Wenlock	433.4-427.4	Southern Appalachian Basin (A)	Frest et al., 2011
<i>Sphaeronites rossicum</i>	Diploporida	Asaphus Limestone, Sweden; Boda Limestone, Sweeden	Sandbian	458.4-453.0	Baltica (B)	Kesling 1967
<i>Trematocystis magniporatus</i>	Diploporida	Osgood Formation, Indiana, USA	Wenlock	433.4-427.4	Cincinnati Basin (C); Southern Appalachian Basin (A)	Frest et al. 2011
<i>Triamara ventricosa</i>	Diploporida	Osgood Formation, Indiana, USA; Osgood Formation, Tennessee, USA	Wenlock	433.4-427.4	Cincinnati Basin (C); Southern Appalachian Basin (A)	Frest et al. 2011
<i>Tristomiocystis globosus</i>	Diploporida	Boyle Formation, Kentucky, USA	Givetian (Devonian)	387.7-382.7	Cincinnati Basin (C)	Sumrall et al. 2009
<i>Stephanocrinus angulatus</i>	Coronidea	Rochester Shale, New York, USA; Rochester Shale, Ontario, Canada	Wenlock	433.4-427.4	Northern Appalachian Basin (P)	Brett et al. 1983
<i>Canadocystis barrandei</i>	Paracrinoidea	Valcour Formation, Quebec, Canada; Chaval Formation, Quebec, Canada	Dapingian-Darriwilian	470.0-458.4	Southern Laurentia (S)	Hoffman 1963
<i>Hemicosmites grandis</i>	Rhombifera	Steinvika Limestone Formation, Norway	Actinian regional age; est. Sandbian-Katian	458.4-445.2	Baltica (B)	Bockelie 1979
<i>Eurekablastus rozhnovi</i>	Parablastoidea	Wah Wah Limestone, Utah, USA; Filmore Formation, Utah, USA	Ibexian-Whiterockian; est. Dapingian-Darriwilian	470.0-458.4	North of Transcontinental Arch (R)	Sprinkle and Sumrall 2008
<i>Hyboocrinus nitidus</i>	Crinoidea	Bromide Formation, Oklahoma, USA	early Sandbian	458.4-453.0	Western Midcontinent (W)	Sinclair, 1945
<i>Rhopalocystis destombesi</i>	Eocrinoidae	Tansikht Bridge, Morocco	Tremadocian	485.4-477.7	Gondwana (G)	Ubaughs 1963

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<i>Gogia spiralus</i>	Eocrinoidea	Wheeler Formation, Utah, USA	middle Cambrian	521-500.5	North of Transcontinental Arch (R)	Sprinkle 1973
<i>Cheirocystis fultonensis</i>	Rhombifera	Point Pleasant Formation, Ohio, USA; Kope Formation, Ohio, USA	Richmondian	449-445.6	Cincinnati Basin (C)	Sumrall and Schumaker 2002

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