**Table S2. Elastic modulus and ultimate properties of *P. lividus* CD ligament and other echinoderm and non-echinoderm collagenous structures.** Values shown are means and/or ranges. Double hyphens indicate lack of information. Since these mechanical parameters tend to be strain rate-dependent, the experimental strain rates are included, where known.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Class and species | Anatomical structure | Strain rate  (s-1) | Young’s  modulus (MPa) | Tensile  strength (MPa) | Breaking  strain | Reference |
| Asteroidea |  |  |  |  |  |  |
| *Echinaster spinulosus* | aboral body wall | 0.01-0.02 | 249-353 | 37-45 | 0.12-0.15 | O’Neill, 1989 |
| *Coscinasterias calamaria* | aboral body wall | 0.09-0.23 | 10.56 | 3.27 | 0.43 | O’Neill & Withers, 1995 |
| *Linckia laevigata* | aboral body wall | 0.0004-0.004 | 20.9-36.0 | 3.65-6.27 | 0.23-0.30 | Motokawa, 2011 |
| Echinoidea |  |  |  |  |  |  |
| *Paracentrotus lividus* | compass depressor ligament | 0.003-0.250 | 18.6; 3.3-44.2 | 8.1; 1.5-23.2 | 1.51; 0.56-6.50 | This paper |
| *Eucidaris tribuloides* | spine ligament | 0.006 | 25 | 8 | -- | Szulgit & Shadwick, 1984 |
| *Eucidaris tribuloides* | spine ligament (in catch state) | -- | 200 | -- | -- | Trotter & Koob, 1989 |
| *Anthocidaris crassispina* | spine ligament (ACh-treated) | 0.005-0.5 | 230-420 | 18-38 | -- | Hidaka & Takahashi, 1983 |
| Holothuroidea |  |  |  |  |  |  |
| *Stichopus chloronotus* | dermis | -- | 0.024 |  |  | Motokawa, 1982 |
| *Holothuria leucospilota* | dermis | -- | 0.42 | -- | -- | Motokawa, 1984 |
| *Actinopyga echinites* | dermis | -- | 1.67 | -- | -- | Motokawa, 1984 |
| *Cucumaria frondosa* | collagen fibril | 0.002-0.006 | 470; 110-1470 | 230; 40-490 | 0.80; 0.33-1.83 | Shen et al., 2010 |
| *Cucumaria frondosa* | collagen fibril | -- | 400-1200 | 500 | -- | Eppell et al., 2006 |
| Ophiuroidea |  |  |  |  |  |  |
| *Ophiocomina nigra* | intervertebral ligament | -- | -- | 6.17; 2.20-11.47 | -- | Wilkie, 1988 |
| Myxini |  |  |  |  |  |  |
| *Myxine glutinosa* | tongue retractor tendon | 0.13-0.25 | 290 | 47.8 | 22 | Summers & Koob, 2002 |
| Mammalia |  |  |  |  |  |  |
| Rat | tail tendon | 0.0013 | 1304 | 40-80 | 0.05-0.17 | Kastelic & Baer, 1980 |
| Rat | collagen fibril | -- | -- | 100-500 | -- | Craig et al., 1989 |
| Cow | digital extensor tendon | 0.1 | 639 | 95.7 | 0.231 | Legerlotz et al., 2013 |
| *Homo sapiens* | patellar tendon | 0.006 | 2,000 | -- | -- | Svensson et al., 2012 |
| *Homo sapiens* | collagen fibril | 0.05 | 2800; 70-5100 | -- | -- | Svensson et al., 2012 |

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