



**Figure S1.** Astrophorina 28S (C1-D2) maximum likelihood (ML) tree reconstructed with RAxML. ML bootstrap supports (1000 bootstrap replicates) >70 are indicated. Genbank accession numbers are given after each taxon. In bold are new sequences produced in this study. Geodiidae species have purple branches, Calthropellidae have brown branches. Red branches indicate Geodiidae species which secondarily lost sterrasters (species previously considered to belong to the Ancorinidae). Colored dots indicate sequenced species/specimens for which previous authors or this study have observed the surface of sterrasters with SEM (see Table 3 for references); round shapes represent sterrasters, flattened shapes represent aspidasters.