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1 **Annual variation of species richness and lorica oral diameter characteristics of tintinnids in a**
2 **semi-enclosed bay of western Pacific**

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18 **ABSTRACT**

19 Much has been written on annual variation of tintinnid assemblages although the mechanism
20 causing the annual variation has been poorly studied either in form of species richness or Lorica
21 Oral Diameter (LOD) size-classes. In the present study, a 10-year (May 2003 to December 2012)
22 survey on species occurrence, abundance, and LOD variation of the tintinnid ciliates was conducted
23 in Jiaozhou Bay, western Pacific. In contrast to previous studies, we found summer peaks in
24 tintinnid species richness in Jiaozhou Bay validated by multi-year investigations. We studied
25 phenology of every tintinnid species and explored the mechanism causing the annual variation. The
26 hypothesis was that tintinnid species richness has a winter baseline, to which warm water species
27 added with the progress of the season. We defined the occurrence types of each species, and found
28 there was only one cold occurrence type species. There was no overlap of cold occurrence type and
29 warm occurrence type in the transitional period between winter and summer. The second aim of this
30 study was to explore annual variations in tintinnid assemblages in form of LOD and redundant
31 species. The species frequency distribution patterns among LOD size-classes were similar all year

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