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Diurnal Vertical Migrations of Antarctic Macroplankton: Salpidae Ctenophora, Siphonophora, Chaetognatha, Polychaeta, Pteropoda

Ye. A. Pakhomov

Southern Scientific Research Institute of the Fishing Industry and Oceanography, Kerch

Materials collected from February to April 1989 on the 43rd cruise of the r/v *Dmitriy Mendeleyev* on a section along 15° E between 52 and 71° S, and also in the neighborhood of Mordvinov Island and Bransfield Strait in multiday test ranges were analyzed. The macroplankton was collected during the daytime and nighttime using a closing Mel'nikov trawl in the layer 0–200 m at 5–10 horizons.

Three types of vertical distribution (Figures 1 and 2) were discovered for the 12 investigated species of macroplankton at different times of day: 1) ordinary migration, rising toward the surface at nighttime and descent into the lower-lying layers during daytime (Polychaeta: *Tomopteris sp.*, *Rhynchonerella bongraini*; Pteropoda: *Clio sulcata*, *Limacina helicina*; Salpidae: *Salpa thompsoni*, *Ihlea racovitazai*; Ctenophora: *Pleurobrachia pileus*); 2) absence of diurnal vertical migrations with a predominant concentration of plankters in the layer with reduced water temperatures (Chaetognatha: *Sagitta gazellae*, *Eukrohnia hamata*); 3) absence of diurnal vertical migrations with predominant concentration in warm deep waters (Chaetognatha: *Sagitta marri*; Siphonophora: *Dimophyes arctica*, *Diphyes antarctica*).

In some cases the layer of the seasonal pycnocline and the cold interlayer remained impenetrable for some of the specimens of active migrants (for example, *S. thompsoni*). Research confirmed that the maxima of the number of species which may compete in feeding usually did not coincide vertically. In species with clearly expressed seasonal ontogenetic vertical migrations diurnal migrations were absent. The collected data do not negate the Mackintosh hypothesis (*Mackintosh* [1937]) on the use of diurnal and seasonal migrations for conserving the range in a moving habitat. They may be useful in defining types of indicators because without allowance for the problems related to the microdistribution of the plankters, their vertical migrations, as well as the effects of avoidance of nets and passing through them this work is still far from completion.

References

Mackintosh, N. A., The seasonal circulation of the Antarctic macroplankton, *Discov. Rep.*, *16*, 365–412, 1937.

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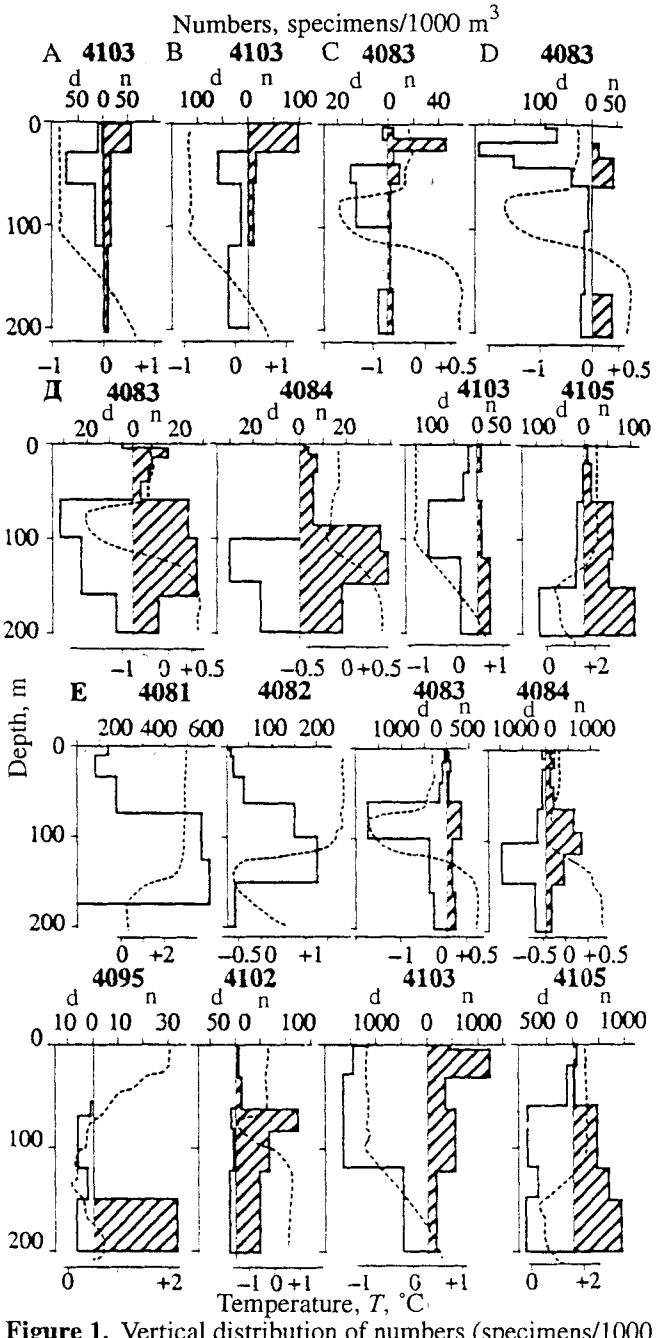

Figure 1. Vertical distribution of numbers (specimens/1000 m^3) of *Tomopteris* sp. (A), *Rhynchonerella bongraini* (B), *Clio sulcata* (C), *Limacina helicina* (D), *Sagitta gazellae* (E) and *Eukrohnia hamata* (F) in Atlantic sector of the Antarctic Ocean from catches with Mel'nikov trawl. Notations: d = daytime; n = nighttime.

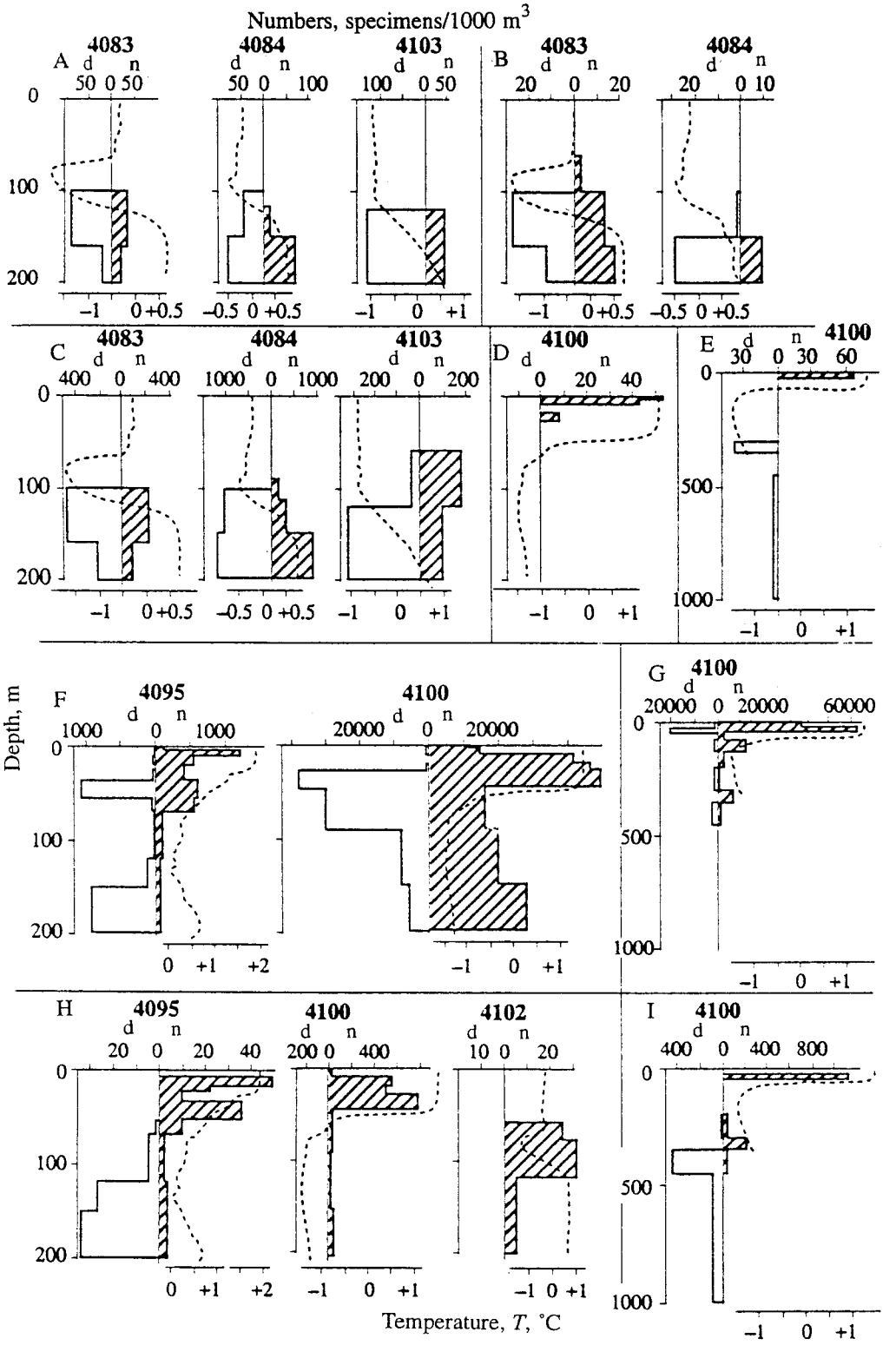

Figure 2. Vertical distribution of numbers (specimens/1000 m^3) of *Sagitta mari* (A), *Diphyes antarctica* (B), *Dimophyes arctica* (C) from catches with Mel'nikov trawl (MT) (F), and also *Pleurobrachia pileus* from catches with MT and DZhOM trawls (E), *Salpa thompsoni* from catches with MT (F) and DZhOM (G) trawls, *Ihlea racovitzai* from catches with MT (H) and DZhOM (I) trawls in Atlantic sector of the Antarctic Ocean. Notations: same as in Figure 1.