

## Sebaran dan kelimpahan foraminifera bentik serta catatan pertama tentang foraminifera agglutinifera di Delta Solo dan Porong-Jawa Timur

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### Abstrak

Penelitian foraminifera bentik telah dilakukan tanggal 19 November - 3 Desember 1995 di Delta Solo dan Porong Jawa Timur untuk mengetahui distribusi dan kelimpahan foraminifera bentik dan untuk mengetahui foraminifera agglutinifera di Delta Solo dan Porong. Untuk itu telah diambil sampel sedimen dengan menggunakan Van Veen grab di 15 stasiun pada masing-masing delta, kemudian dianalisis di laboratorium. Untuk mengetahui keterkaitan antara komunitas foraminifera bentik dan beberapa faktor lingkungan yang berpengaruh dalam kehidupan biota ini, maka dilakukan juga pengukuran terhadap sifat fisik perairan seperti kedalaman, salinitas, PH dan turbiditas. Hasil analisa laboratorium kemudian dibagi ke dalam 3 kategori yaitu melimpah, umum dan jarang. Penelitian ini bertujuan untuk mengetahui distribusi dan kelimpahan foraminifera bentik dan untuk mengetahui foraminifera agglutinifera di Delta Solo dan Porong.

Hasil analisis menunjukkan terdapat 53 spesies foraminifera bentik dengan jumlah individu 7288 yang termasuk dalam 10 famili di Delta Solo dan 37 spesies dengan jumlah individu 6223 yang termasuk dalam 9 famili di Delta Porong. Seluruh spesies yang dijumpai di dua delta tersebut termasuk dalam subordo Rotaliina, Valvulineriina dan Textulariina. Spesies yang melimpah di Delta Solo adalah *Ammonia beccarii* dan *Asterorotalia trispinosa* yang dijumpai di semua stasiun penelitian. Terdapat 35 spesies yang termasuk kategori umum dan 16 spesies pada kategori jarang. Di Delta Porong dijumpai 6 spesies dalam kategori melimpah yaitu *Ammonia beccarii*, *Asterorotalia trispinosa*, *Ammobaculites agglutinans*, *Haplophragmoides canariensis*, *Textularia pseudogramma* dan *Trochammina amnicola*. Sedangkan spesies yang umum 16 spesies dan 15 spesies yang tergolong jarang.

Sebaran dan kelimpahan foraminifera bentik di Delta Solo dan Porong dipengaruhi oleh beberapa faktor lingkungan terutama jenis substrat, pH dan turbiditas. Hasil pengamatan terhadap foraminifera agglutinifera menunjukkan keadaan sebaliknya dan hasil foraminifera bentik secara umum, yaitu Delta Porong lebih kaya akan spesies dibandingkan dengan Delta Solo. Di Delta Solo dijumpai 5 spesies yang hanya dijumpai di 2 stasiun, sedangkan di Delta Porong dijumpai 6 jenis yang dijumpai di semua stasiun penelitian. Hal ini kemungkinan besar dipengaruhi oleh kondisi lingkungan perairan dan keadaan delta tersebut.

Solo and Porong Deltas, located in East Java, have different morphological forms. The differences in morphological forms are due to the variation in the sediment types. Solo River which flows from Mount Lawu and Mount Merapi in Central Java supplies a large number of sediment to Solo Delta. The type of sediment of Solo Delta is dominated by clay, silt and fine sand. Porong River receives water from Brantas River which originates from Mount Semeru and Mount Arjuno. The type of sediment of Porong Delta is dominated by sand. Benthic foraminiferans, which live and grow at the bottom of the sediment, are sensitive to environmental changes. Distribution and abundance of benthic foraminifera depend on some environmental factors, and that various ecological factors influence each other.

From 15 stations observed in Solo Delta and 15 stations in Porong Delta there was a difference either in the species number or in the number of individuals found. The species are belong to 3 subordos, i.e Rotaliina, Milioliina and Textulariina. The main difference between the two deltas was the abundance of species. The number of species found in Solo Delta were 53 and the number of individuals were 7288, while in Porong there were 37 spesies with 6223 individuals. The predominant species found in almost all stations in two deltas were *Ammonia beccarii* and *Aslerorotalia trispinosa*.

In Solo Delta the common species found were *Ammonia umbonata*, *Amphistegina lessonii*, *Bucella frigida*, *Elphidium crispum*, *E. craticulatum*, *E. advenum*, *E. lessonii*, *Calcarina calcar*, *Chrysalidinella dimorpha*, *Quinqueloculina* sp, *Q.semirrumum*, *Q. intricata*, *Nonion* sp, *Nonion depressulum*, *Triloculina trio ata*, *Reuse/la simplex*, *Pseudorotalia schroeteriana*, *Spiroloculina communis*, *Ammobaculites agglutinans*, *Textularia pseudogramen*. The less common species found were *Buliminella elegantissima*, *B. basicostata*, *Cymbaloporetta squwnmosa*, *Cibicides lobatum*, *Hauerina braayi*, *Heterostegina depressa*, *Lagena laevis*, *Lagena grad/lima*, *Loxostomum lobatum*, *L. limbatum*, *Massilina milled*, *Operculina ammonoides*, *Triloculina trigonula*, *Ammotium cassis*, *Haplophragmoides canariensis* and *Textularia sagittula*.

In Porong Delta, besides *Ammonia beccarii* and *Asterorotalia trispinosa* other species which were found abundant in almost all of the stations were *Ammobaculites agglutinans*, *Haplophragmoides canariensis*, *Textularia pseudogramen* and *Trochammina amnicola*. The latest species are agglutinated foraminifera which live well at the sandy sediment dominating Porong Delta. The common species were *Adelosina semistriata*, *Ammotium cassis*, *Elphidium advenum*, *E craticulatum*, *E. lessonii*, *Pseudorotalia shroeteriana*, *Heterostegina depressa*, *Flintina bradyana*, *Operculina ammonoides*, *Quinqueloculina seminulum*, *Q. lamarchiana*, *Nonion* sp, *Reusella simplex*, *Triloculina tricarinata*, *spiroloculina commis*, *Textularia sagittula*. The rare species found were *Amphistegina lessonii*, *Calcarina calcar*, *Cibicides praecinctus*, *Crysalidinella dimorpha*, *Loxoslomum lobatum*, *L. limbatum*, *Miliolinella subrotunda*, *M sublineata*, *Nonion depressulum*, *N. cf asterizans*, *Qrbitolites duplex*, *Quinqueloculina cultrata*, *Q. venusta*, *Q. granulocostata*, *Triloculina trigonula*.

The range of salinity in Solo Delta was 15 - 32 ‰ and in Porong Delta was 10 - 30 ‰. Previous researchers showed that foraminiferan species adapt and produce well at salinity between 15 - 40 ‰. That means that the salinity in Solo Delta is probably more suitable for foraminifera than in Porong Delta. The everage pH in Solo Delta was 7,86 while in Porong Delta was 8,20. According to some researchers, foraminiferans were found abundant in lower pH. Turbidity in Solo Delta was between 33,0 - 87,5 NTU, while in Porong Delta areas was between 37,8 - 200 NTIJ. That means that the water in Solo Delta was clearer than in Porong Delta. Water clearance influences penetration of sunlight , and results in decreasing photosynthesis activities of plankton which leads to food deficiency. According to previous researchers the population of some foraminiferans decreases at zones with high turbidity. Those above factors might influence the distribution and abundance of the benthic foraminifera, of both deltas.

The study of agglutinated foraminiferan was done simultaneously with the study of distribution and abundance of benthic foraminiferans in Solo and Porong Delta. From 15 stations studied in each delta 5

species were found in Solo Delta and 6 species were found in Porong Delta. All species belongs to 3 families, namely Lituoliidae, Textulariidae and Trochanuniniidae. The 5 species found in Solo Delta were *Ammobaculites agglutinans*, *Ammotium cassis*, *Haplophragmoides carurriensis*, *Textularia pseudogramen* and *T. sagittula*. In Porong Delta, besides those 5 species, another species, i.e. *Throcarnmrna amnicola*, was also found.

In general, Porong Delta is richer than Solo Delta in number of species and number of individuals of species. This might be due to the differences in types of sediment and water conditions of both deltas.