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The mathematical theory of endosymbiosis. I. (English) Zbl 1231.53020

Summary: We present a new model of the evolutionary process formulated by the Serial Endosymbiosis Theory represented by a succession of stages involving different metabolic and ecological interactions among populations of bacteria considering both the population dynamics and production processes of these populations. In such an approach we make use of systems of differential equations known as Volterra-Hamilton systems as well as some geometric concepts involving KCC theory and the projective geometry of Berwald spaces and also correct a statement of M. Matsumoto in the literature on this topic. We also recount in some detail previous work comparing production stability of Endosymbiosis Theory with that of Ancestral Commune Theory.

MSC:
92D15 Problems related to evolution
34A26 Geometric methods in ordinary differential equations
53B40 Local differential geometry of Finsler spaces and generalizations (areal metrics)

Keywords:
Finsler and projective geometries; KCC-theory; biological evolution; endosymbiosis; ancestral commune; Berwald spaces; Volterra; Hamilton systems

Software:
FINSLER

Full Text: DOI

References:
[10] ()

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[16] Cartan, E., Observations sur le mémoire précédent, Math. Z., 37, 619-622, (1933) · Zbl 0007.23101


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